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UNION OF SOUTH AFRICA.

PROVINCE OF THE CAPE OF GOOD HOPE.

MARINE  
BIOLOGICAL REPORT.

No. IV.

For the period ending 30th June, 1918.

*To be presented to the Provincial Council*

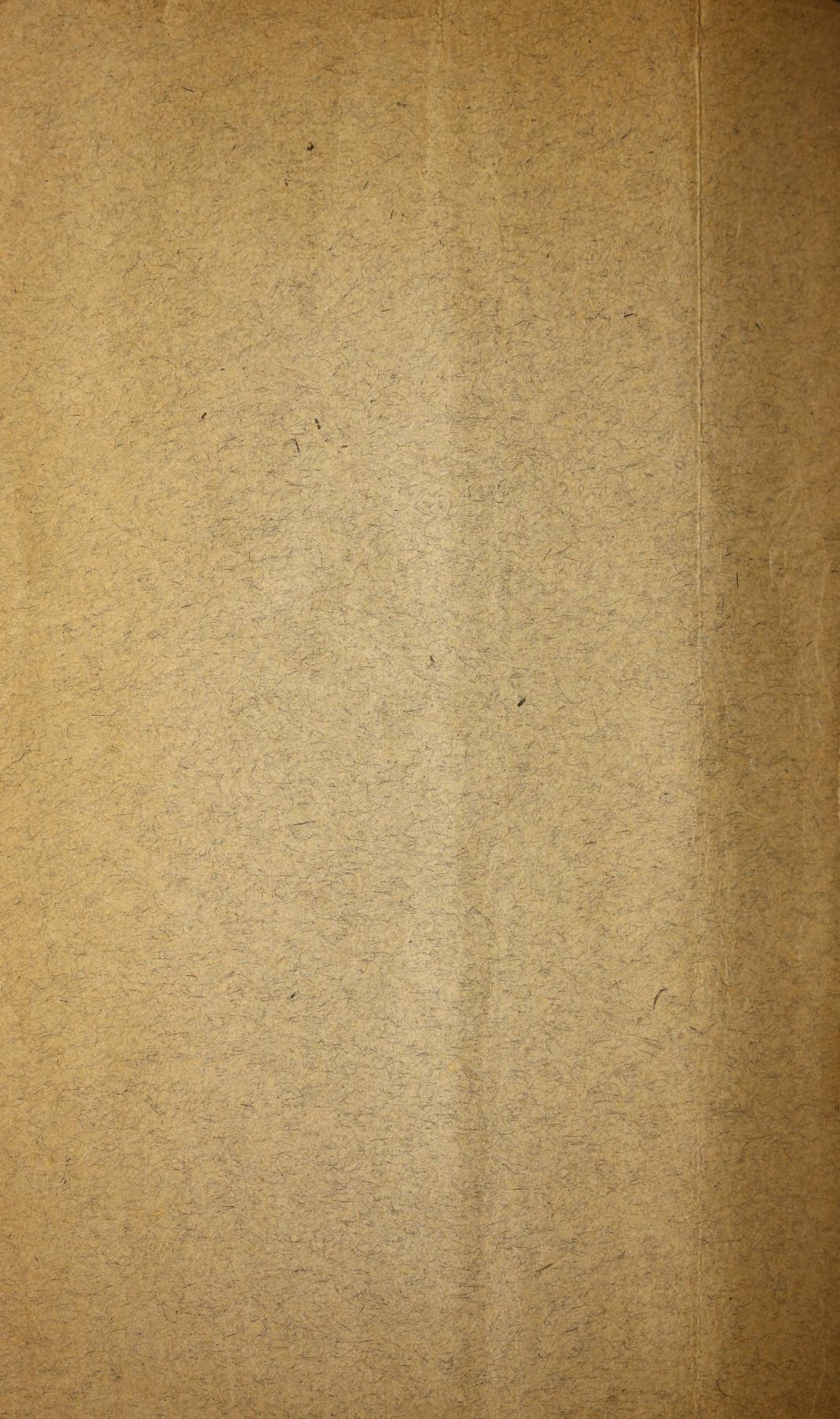


CAPE TOWN:  
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1918.

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C.T.Ltd.—B2633.

[C.P. 3—1918.]



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PROVINCIAL SECRETARY,

SIR,—I have the honour to submit the following report on fishery investigations. Some questions with regard to the now important crawfish industry are dealt with, such as variation in catches, migratory movements, of importance chiefly in connection with the proposed permanent closure of certain areas, and the possibility of artificial rearing of crawfish, should this become necessary in view of possible danger to the industry by over fishing. The results of certain experimental nettings are given in detail, in connection with the much disputed question of netting in rivers. In a report by a voluntary worker, Dr. Fantham, attention is drawn to the desirability of investigating the protozoal parasites of fishes, a matter which may also have important practical bearings.

In view of the present scarcity of fish and the inadequate supply, which is unable to meet the growing requirements of South Africa, especially at the present time, attention is being directed to the desirability of a continuation of the survey of the unknown fishing areas of the South African seas, and a short memorandum on the subject, drawn up at the request of the Scientific and Technical Committee of the Industries Advisory Board, is added as an appendix to this report.

Fishing investigations in the Cape Province have sustained a loss by the death of Mr. Wardlaw Thompson, who for several years has voluntarily devoted himself to the much-needed catalogue and descriptions of South African fishes. His third list of Cape Fishes, which completes the catalogue of fishes of the Cape Province, is included in this report.

I have the honour to be,

Sir,

Your obedient Servant,

J. D. F. GILCHRIST.

Cape Town,  
31st July, 1918.



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# UNION OF SOUTH AFRICA.

## MARINE BIOLOGICAL REPORT.

### I. — CRAWFISH INVESTIGATIONS, INCLUDING EXPERIMENTAL HAULS, ARTIFICIAL REARING AND MIGRATORY MOVEMENTS OF THE CAPE CRAWFISH, (*JASUS LALANDII*.)

The chief objects kept in view in this work have been (1) the continuation of the series of hauls at regular intervals and at definite places in order (a) to ascertain if any variation in the supply of crawfish is taking place, (b) to obtain further information as to times of spawning and condition of fish, and if any variation in this takes place from time to time, (c) to ascertain in what localities mature females and young occur with a view to their protection in such areas.

(2) To obtain further information as to the life history of the crawfish, some of the stages of which are not yet fully known.

(3) To carry out experiments in artificial hatching, with a view to ascertain some practical method of supplementing the supply of crawfish, should this become necessary.

(4) To ascertain if there is any extensive migration or movement of crawfish from one locality to another, in connection with such questions as the possibility of a natural restocking of exhausted areas, and the utility of establishing sanctuaries, where crawfish may congregate more or less permanently.

The work has been hampered to a considerable extent by the impossibility of obtaining the requisite equipment. Dredges, trawls, townets, etc., were ordered some months ago, but have not arrived, owing to present war conditions. Great difficulty was also experienced in procuring a suitable boat for carrying out the work.

(I) *Experimental Hauls.*—These have been continued on the same lines as in previous years with the exception of a short period during which a temporary close season was imposed from 15th May to 15th June. During this period, at the request of the canning companies, the method was slightly altered, namely, when no fish were procured at a locality other hauls were made in the neighbourhood until fish were got. This had the advantage of procuring more

fish for examination, but was not suitable for estimating their comparative abundance. This period will therefore be treated separately (p. 3). The full particulars of the hauls are given on pp. 11-43.

It cannot be said from these experimental hauls that any diminution in the supply of crawfish has been detected, but this could hardly be expected in view of the comparatively short time the experiments have been carried on. They should be continued systematically.

No increase or diminution in size of crawfish captured has been detected.

The hauls in 1916 from July to September show remarkably few spawning fish as indicated by the presence of "berry" or the possession of a soft new shell. It was only in October that they were procured in fair abundance and this continued till about the middle of December. In 1917 the spawning season seems to have commenced earlier and females in berry were plentiful about the beginning of June.

It will be observed from the returns that there are frequently cases of spawning and casting of shell which occur throughout the year. Thus males in soft shell are found to occur in the winter months, and females in the summer months. This is confirmed by observations of the animals in captivity. Thus in the tanks of the Marine Laboratory at St. James a male of  $4\frac{1}{4}$  inches cast its shell on May 20th and females cast their shells from May 30th up to the middle of August as shown in the following table.

Size.	Date of Casting Shell.		
3 inches .. ..	30th May, 1917.		
4 $\frac{1}{2}$ " .. ..	7th June, 1917.		
3 $\frac{1}{2}$ " .. ..	7th June, 1917.		
2 $\frac{3}{4}$ " .. ..	9th June, 1917.		
3 $\frac{1}{2}$ " .. ..	14th June, 1917.		
2 $\frac{1}{2}$ " .. ..	16th June, 1917.		
2 $\frac{1}{2}$ " .. ..	13th July, 1917.		
2 $\frac{3}{4}$ " .. ..	19th July, 1917.		
3 " .. ..	25th July, 1917.		
2 $\frac{3}{4}$ " .. ..	4th August, 1917.		
2 $\frac{1}{2}$ " .. ..	8th August, 1917.		
3 $\frac{1}{4}$ " .. ..	15th August, 1917.		

An important question with regard to the spawning of crawfish has arisen from observations of the fish in captivity and has been noted in previous reports. This is whether or not the crawfish spawns annually. It has been suggested that there may be two spawning periods during the year, but all the observations made with sufficient accuracy indicate that this is not the case and it could hardly be expected to be so as the fish carries its eggs for several months. Some observations seem to indicate that the spawning may not be

annually as fish which had spawned in one year were observed to have no spawn the following year. This has again been noted as all the above females which had spawned in 1916 showed no indication of breeding in 1917. This of course may be due to the fish being kept in captivity, but it at least indicates the possibility of its being a natural occurrence.

The following is the result of the experimental hauls during temporary close season 15th May to 15th June, 1917.

Fifteen hauls were made (No. 51 to 65) during this season. In each haul four nets were used and these were down for ten minutes. Certain definite areas indicated in the accompanying diagram, were selected and these were visited at intervals. All the areas were examined as far as possible about the same date. These areas were as follows:—

A ..	..	South East of Robben Island.
B ..	..	East of Robben Island.
C ..	..	South of Robben Island.
D ..	..	Between Robben Island and Mainland.
E ..	..	Blaauwberg Strand (N.)
F ..	..	Blaauwberg Strand (S.)
G ..	..	New River Mouth.
H ..	..	Salt River Mouth, off Milnerton.
I ..	..	Woodstock Beach.
J ..	..	Green Point.
K ..	..	Clifton.
L ..	..	Oude Kraal.

On the 16th May no fish were found at Woodstock Beach (Area I) but nine males in hard old shell were found at Salt River Mouth. Five of these were from two to three inches, the rest four to seven inches, three females being found in hard old shell. There were no fish at the New River Mouth nor at Blaauwberg Strand (Area F).

On the 18th May the more northern localities selected were visited and at the northern part of Blaauwberg Strand 24 large (5-7 inches) males were found but no females. No fish were procured between Robben Island and the Mainland. At Robben Island (Area B) 19 males and 29 females were found all apparently in hard new shell. They were all fairly large fish.

On the 30th at Oude Kraal 72 males were procured, the majority of them being about 3 inches. Females were absent.

Up to this time *no females in spawn were observed*, but, on the 4th June, in a total haul of 43, about half were females and of these 14 were in berry and one in soft new shell. It is of interest to note also that *at the same time and place* about an equal number of males were found. On the same date at Green Point crawfish were very scarce, only one large male in hard old shell being found and no females. At Granger Bay (near the Breakwater) males and females were in abun-

dance, but spawning was not so far advanced, only 8 out of 194 females being in berry.

On the following day (5th June) hauls were made in the Robben Island area, near Whale Rock, and from these it would appear that spawning is later in this region, no females in berry being found. Two localities were visited here, one half a mile west of Whale Rock and one a mile east of Whale Rock. No females were found and only 7 males at the former locality; at the latter 88 males were found and 6 females, three of which were in soft new shell indicating the approach of the breeding season.

The southern localities (Woodstock and Clifton) were again visited at a later date (14th), and, while at the former locality no advance towards the breeding season was observed, at the latter there was a marked advance, 40 out of 43 females captured being in berry.

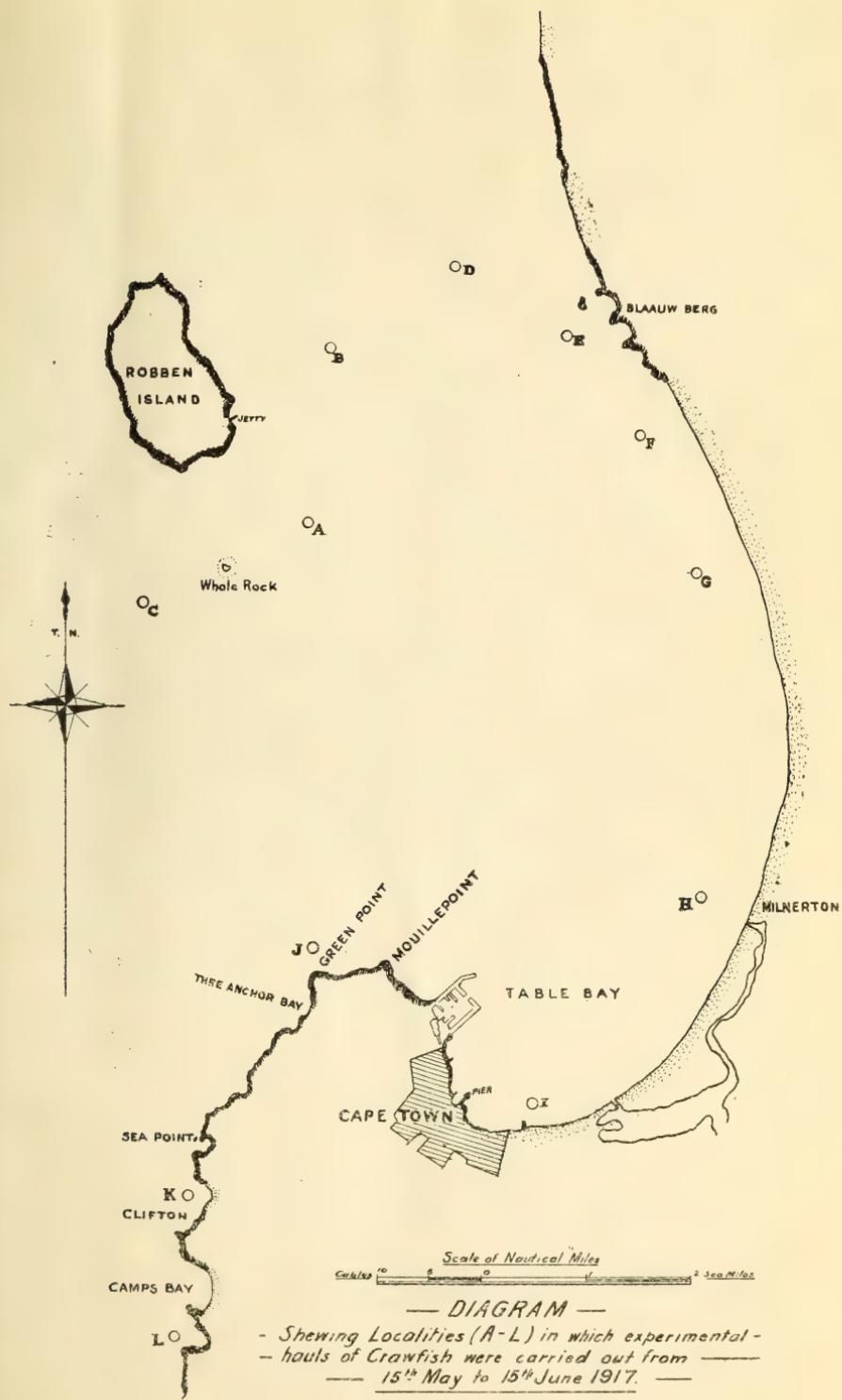
Reviewing the results as a whole it may be noted that there was no spawning or at least general spawning of crawfish during the month of May. It is of interest also to note that spawning seems to commence somewhat earlier in the more southern regions of the Table Bay area.

One somewhat remarkable fact is the apparent presence of males in hard new shell during these two months. This might be explained by a mistaken identification of the hard new shell condition, but as confirmation of the fact that males may shed their shell at this time we have the record of 1 male in soft new shell from Granger Bay on the 4th June and as many as 8 from near Whale Rock on the 5th June.

On the whole the results of these special hauls are confirmatory of what has been found elsewhere regarding the breeding of the crawfish.

The practical result of this special examination is to show that (in this year at least) spawning had not commenced in the latter half of May, that is there was no extrusion of the eggs though the ovaries were well advanced. Probably therefore many of these fish would be in the "berried" condition by the end of this temporary close season. It has been accepted that it is very necessary to protect the female in berry both in the case of the Cape Crawfish here and the lobster in other countries. It follows that a great deal of good would result from the further protection of females, which are about to extrude their eggs and assume the berried condition.

I have drawn attention to the fact that there are some indications that the female crawfish does not spawn every year, but until this is definitely established it may be assumed that it does so, and, if this be the case, it will be obvious that non-berried females in May and the beginning of June require almost as much protection as those which have already become berried. A close season at this time would therefore seem





to be well worthy of further consideration. From observations of the crawfish in captivity it appears that one male may attend several females during the season. This has been actually observed, and may further be rendered fairly certain from the fact that the female has been observed to extrude her ova only two or three days after copulation. It follows therefore that there is a much greater necessity for protecting the female than the male.

(2) *Stages in Life History of Crawfish*.—It is of importance from a practical point of view to ascertain the form and habits of the young crawfish. We have found that the first stage after hatching is in the form of a small somewhat opaque form which swims rapidly to the surface of the water by means of its antennae. It is then transformed into a flat transparent form which swims about by means of special swimming branches developed on the legs. It apparently then descends to the bottom of the sea and by a series of stages becomes larger. During this process it would appear to migrate to much deeper waters, as larger forms resembling the last mentioned are found there. We have been unable as yet however to be quite certain of this, as there are no adequate facilities for deep water trawling. With the means at disposal however it has been possible to fish with a special trawl in fairly deep water from a motor boat. The continuation of this deep-sea work will probably clear up some points in the development and migratory movements of the young crawfish. The next stage which is undoubtedly a young crawfish is the "puerulus" stage, which has hitherto only been found close inshore. Only a very few of these have been got, chiefly clinging to set nets when taken out of the water.

As a result of recent investigations some further advance has been made in the elucidation of the life history of the crawfish, namely the discovery of the normal habitat of the "puerulus" stage. These were found in the course of trawling with the special net above mentioned. Specimens of this stage were found at the following dates and localities :—

- 2/11/17 Between Breakwater and Green Point Light-house.
- 7/11/17 Between Breakwater and Green Point Light-house.
- 4/12/17 Grainger Bay inside Breakwater.
- 5/12/17 Granger Bay inside Breakwater.

Some of these were taken to the marine laboratory in the hopes that they might be kept alive till they reached the next stage in their development which was unknown. They proved to be fairly hardy animals, and, when placed in a specially arranged tank with a good supply of sea water, thrived very well. The typical red spots of the puerulus stage gradually disappeared, and a dark olive brown began to appear under

the cuticle. Within a few days they cast their shell and assumed an appearance markedly different from the puerulus stage. The details of this transformation together with observations on the habits of the animal at this stage will be given elsewhere. This new stage may be called the postpuerulus stage as it is not yet quite like the adult.

(3) *Artificial Rearing of Crawfish*.—The hatching and rearing of crawfish has not hitherto been carried out with success in any country in which they are found. In Europe they do not occur in sufficient quantities to justify such experiments. They occur however in California and in Japan in large numbers where crawfish fisheries are of some considerable importance. Attempts to rear them have not hitherto been successful. The ordinary methods used for rearing lobster cannot quite be followed, as the various stages through which the crawfish passes before reaching the adult condition are very different from those of the lobster. In the case of the Cape crawfish our experiments have shown that there are two stages—the naupliosoma and the phyllosoma—which are passed through before reaching the first stage of the young lobster.

In the experiments which have been begun during this season our first endeavour has been to rear the young crawfish from the time of fertilisation of the egg up to the time of hatching. The crawfish carries its eggs externally for some months, and, during this time, they are liable to injury and attacks from other marine animals. It has been found that many fish devour the eggs in large numbers, especially about the time of spawning, and if the crawfish eggs can be reared under conditions which will keep them free from such enemies a great gain would be secured by such artificial rearing.

Six female crawfish were selected with eggs believed to be at an early stage. They were placed in a well aerated tank and samples of eggs were taken from each crawfish twice a week up to the time of hatching. These were then examined microscopically by means of whole mounts and by sectioning so that the actual process of development could be carefully checked. It had however to be determined at what stage the youngest eggs were, and this was found by comparing them with eggs which had previously been seen escaping from the body of a female crawfish, the exact date of extrusion being therefore known. It was shown in this way that these youngest eggs were at a stage four or five days after fertilisation. This stage is characterised by the presence of about 20 nuclei at the periphery of the egg, each nucleus representing a blastomere or primitive segment of the egg. Seven days after, the nuclei had increased in numbers with a special thickening of the blastoderm at one spot. Thereafter development proceeded without interruption, through a nauplius stage, characterised by very long biramose antennae,

to an embryonic stage in which the antennae were provided with long transparent feather-like outgrowths. The various stages through which the embryo passed need not be here fully described. It is sufficient to note that after several weeks the embryonic development was completed and the young crawfish escaped from the egg in a perfectly normal condition. Thousands of such young could be readily procured. At first the young crawfish swam rapidly to the surface by the feather-like antennae, the other appendages being folded close to the body and not used (the naupliosoma stage). In a few hours after gaining the surface they passed into the phyllosoma stage, and were able to move in a horizontal direction, always congregating at the most lighted part of the water as already noted in previous experiments.

It was thus shown that the crawfish can be hatched out from the egg from its earliest stages and the larvae procured in unlimited numbers. It was, however, found that though the young crawfish could be artificially tided over the egg stage, the free surface-swimming, to which they could be reared, was even more liable to attacks of enemies. Thus when a few hundred newly-hatched larvae were placed in a large tank containing fish they were almost at once attacked by the surface-feeding harders (mullet). The other fish in the tank did not readily attack them; thus a few were taken by maasbankers, though none were taken by dasjes which were present.

Obviously therefore the next series of experiments had to be directed to the solution of this more serious difficulty, viz., the possibility of protecting the surface-swimming stages of the naupliosoma and the phyllosoma. Attempts were first made to ascertain how long these surface stages lasted, and when the young crawfish began to descend to the comparative safety of the ground-feeding conditions. The naupliosoma stage had been found by former experiments to last, fortunately, only a very short time (a few hours), but what became of the phyllosoma stage had not yet been ascertained. A series of experiments under various conditions was then undertaken, but it was found that it was difficult to keep this stage alive. After swimming about for a few days the young crawfish gradually disappeared, and the dead remains of many were seen on the bottom of the tank, the cause of death being apparently the presence of debris of seaweed, etc., in the water, clogging up the swimming appendages. Rearing in filtered sea water was then tried, but without success as the necessary food for the young was apparently removed in this process. Feeding on a variety of material was then attempted but without success. Finally it was found that the most successful method was to partially filter the water.

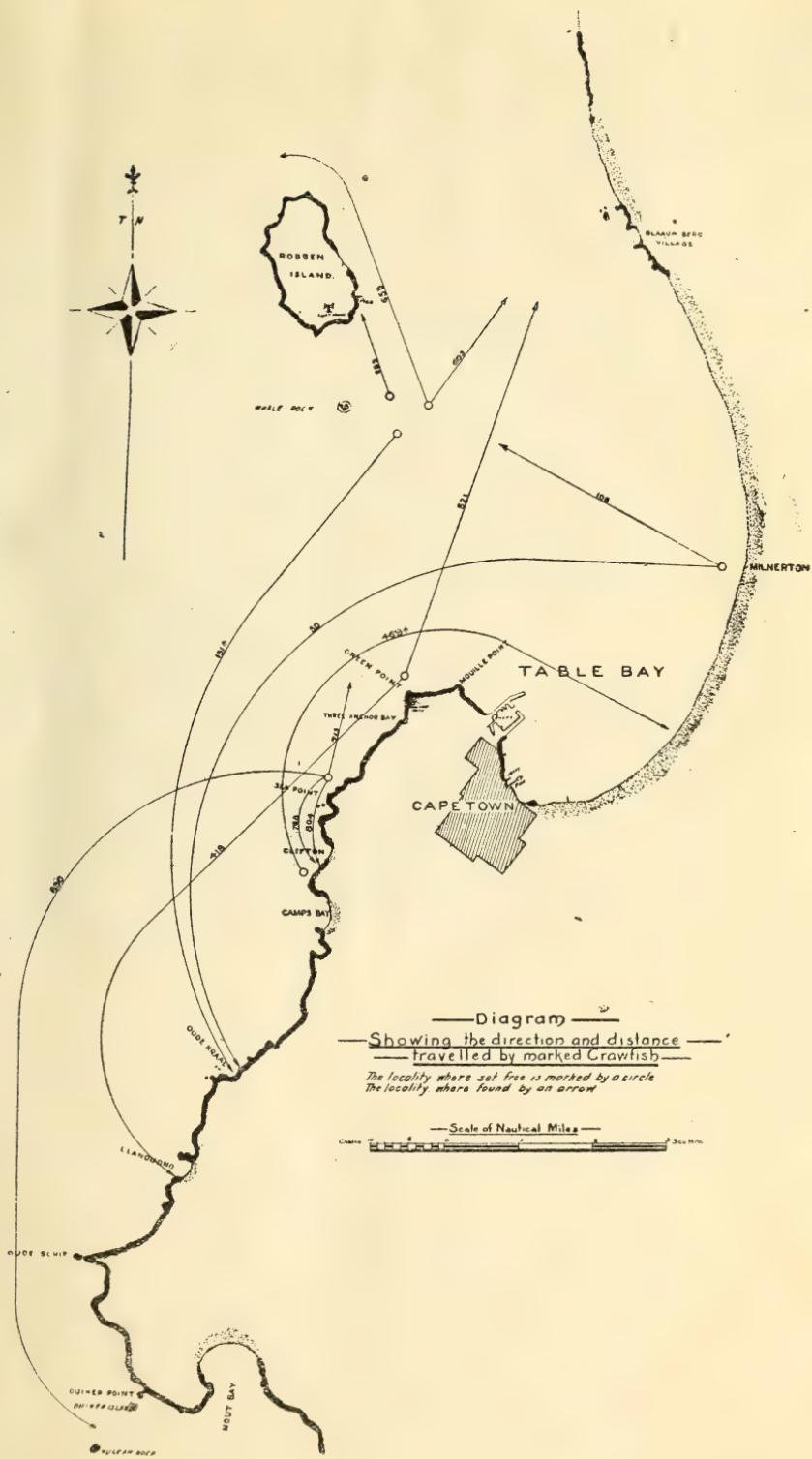
By this means the important fact was ascertained that the whole swimming stage of the young crawfish is comparatively short, being only three or four days at most. After this interval of time they change their habits, and, descend, to the bottom, seek out the darkest corners. They then feed actively on the small animal and vegetable particles in the mud and sand, and are comparatively free from the attacks of their enemies.

The experiments thus briefly summarised are not yet completed, but enough has been shown to prove that artificial cultivation of the crawfish is quite practicable, and to indicate the manner in which this can be carried out on a large scale. Thus they can be artificially hatched even from the earliest stage, though they can be procured more readily in large numbers from later stages. Thousands can thus be obtained from a few crawfish, and, if kept a few days till they assume the ground feeding habits, they can be liberated with perhaps as much safety as in the case of the artificially reared lobster, which is set free at the ground feeding stage.

It may be noted that these experiments (necessarily carried out under somewhat artificial conditions) have been confirmed by a very numerous series of fine nettings in the sea, in which none but the first phyllosoma stage have been found at or near the surface. This stage can readily be recognised as it is characterised by the possession of three only of the five walking legs of the adult.

(4) *Migration of Crawfish.*—A series of marking experiments have been carried out to determine the movements of the crawfish. This was done by attaching a small brass label by means of wire to the basal joints of the antennae. The labels were numbered consecutively and when attached to the fish a note was made of the locality, condition of the fish, size and sex. In all 1,902 of these labels were attached. The factories and fishermen were notified of the experiment, and were requested to give information of the recapture of these marked fish. A reward of 6d. for each fish returned was offered the fishermen.

Of the 1,902 liberated only 21 were again found. This may point to the great quantity of crawfish present in the neighbourhood, and this is rendered probable by the fact stated below where 115 crawfish were labelled in one day, and, of 1,500 caught by a fisherman the following day in the same place, with a view to capturing the labelled crawfish and obtaining the reward offered, none were labelled. It may, however, be due to overlooking of marked fish, though the label is conspicuous, and in the repeated handling of the fish in the boat and factory could hardly be overlooked. There is reason to believe also that the reward offered was not sufficient to induce the fishermen to trouble about retain-





ing the marked fish and returning it. The results attained, however, sufficiently justify the method employed and indicate that it should be followed up on a larger scale. They show that there is in some cases migration to some distance, in others the fish remain apparently at or near the same spot for some considerable time.

Thus of the 21 recaptured fish 8 were found near the same spot. Of these six were recaptured within 1 to 9 days after being released. Two, however, were recaptured in 39 and 31 days respectively near the same spot.

Of the cases where a considerable movement is shown this has usually taken place at no great rate apparently as a considerable period has elapsed between release and capture. The method employed, however, does no more than indicate the minimum rate at which the fish may have travelled.

One case indicates that there may be a very considerable migratory movement apart from the slow wandering about in search of food. This was when a fish (No. 50) set free off Milnerton on the 29th August was found on the 9th September at Oude Kraal having gone a distance of about  $13\frac{1}{2}$  miles in 11 days (vide diagram).

The next case (No. 768) in which the fish was captured within a comparatively short time (14 days) shows a movement from off Sea Point to Clifton. The time and direction of movement in both of these cases is probably indicated by the return. In other cases, however, in which a considerable time has elapsed between the release and recapture of the fish (from 52 to 217 days) the direction indicated may not have been a true movement. Thus for instance in No. 106 the fish may have moved from Milnerton in a southerly direction like No. 50 and then outwards over to the neighbourhood of the Whale Rock.

TABLE OF DISTANCES, DIRECTIONS, ETC., TRAVELED BY CRAWFISH LABELED IN TABLE BAY.

TABLE OF DISTANCES, DIRECTIONS, ETC., TRAVELED BY CRAWFISH LABELED IN TABLE BAY.

No.	Date.	Locality where labelled.	Sex.	Size.	Locality where recaught.	Date.	Apparent distance travelled.	Direction.	Period between catches.
23	16. 8.16	S.E. of Robben Island	Female ..	5 in.	(Near same spot) ..	18. 8.16	13½ miles	S.W. ..	2 days.
50	29. 8.16	Off Milnerton	Male ..	4½ "	Oude Kraal ..	9. 9.16	—	..	11 "
58	16. 8.16	S.E. of Robben Island	Female ..	5½ "	(Same neighbourhood) ..	17. 8.16	—	..	1 "
106	21. 9.16	Off Milnerton	Male ..	6 "	S.E. of Whale Rock ..	1. 11.16	6	N.W. ..	52 "
283	17.10.16	¾ m. E. of Whale Rock	"	4 "	Off Robben Island ..	19.10.16	1 mile (?)	S. ..	2 "
418	8.11.16	Off Green Point	"	4 "	Llandudno ..	1. 3.17	9 miles	..	112 "
463	8.11.16	"	"	7 "	(Same neighbourhood) ..	13.11.16	—	..	5 "
521	10.11.16	"	"	6 "	Between Robben Island and Mainland.	11. 4.17	6½ "	N.E. ..	152 "
603	20.12.16	Off Robben Island	Female ..	5 "	N. of "Robben Island"	1. 5.17	1½ "	N.N.E.	139 "
653	20.12.16	Off Milton Rd., Sea Point	Male ..	5 "	Mouille Point ..	3. 5.17	3½ "	N. ..	141 "
713	12. 1.17	"	Female ..	3½ "	Off Clifton ..	19. 3.17	2	N.E. ..	66 "
768	12. 1.17	"	"	3½ "	(Same neighbourhood) ..	26. 1.17	1½ "	S.S.W. ..	14 "
777	8. 1.17	"	"	5 "	"	25. 3.17	—	..	39 "
790	12. 1.17	"	Male ..	5 "	Off "Clifton" ..	19. 1.17	—	S.S.W. ..	7 "
840	16. 1.17	"	"	3½ "	Between Vulcan Rock and Dyker Island.	19. 3.17	1½ "	..	62 "
850	19. 1.17	"	"	6 "	(Same neighbourhood) ..	24. 8.17	10 "	..	217 "
893	16. 1.17	"	"	4 "	"	25. 1.17	—	..	9 "
962	25. 1.17	Off "Robben Island"	"	4 "	"	3. 2.17	—	..	9 "
114A	17. 3.17	Off "Robben Island"	"	3½ "	"	16. 5.17	—	..	31 "
151A	24. 3.17	1 mile S.E. Whale Rock	"	5 "	Oude Kraal ..	3. 9.17	8½ "	S.S.W. ..	163 "
469A	4. 6.17	Off Clifton ..	Female ..	4 "	Woodstock Sewer ..	14. 11.17	6 "	N.E. ..	173 "

## EXPERIMENTAL HAULS.

## No. 1.

Date : 10/7/16. Number of Hauls : 4.

Locality : Robben Island ( $\frac{1}{4}$  mile E. of Jetty).

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Smooth. Wind S.W.

Depth : 5 fathoms. Temperature : 55.5°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+

Hard old shell ... ... ... ... 1 3 ... 1

Total, 5. Average number per haul\* 1.25.

Average size : 5.7.

*Female Crawfish.* (None).

## No. 2.

Date : 12/7/16. Number of Hauls : 14.

Locality : Between Wrecks "America" and "City of Lincoln." Nature of Bottom : Sand.

Condition of Sea : Choppy and S.W. Swell. Wind : N.E.

Depth : 3 fathoms. Temperature : 53.7°.

(None Caught).

## No. 3.

Date : 14/7/16. Number of Hauls : 14.

Locality : Between Woodstock Pipes and "America" Wreck

Nature of Bottom : Sand.

Condition of Sea : Choppy. Wind : N.E.

Depth : 3½ fathoms. Temperature : 54.5°.

(None Caught).

## No. 4.

Date : 2/8/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Smooth. Wind : Calm.

Depth : 5 fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,

Hard old shell ... 2 4 4 8 3 5

Total : 26. Average number per haul : 1.85.

Average size : 5.3.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,

Hard old shell ... ... 7 10 3 ... ..

Total : 20. Average number per haul : 1.43.

Average size : 4.2.

\*A haul means one net down for 10 minutes in schedules 1 to 50 and 66 to 77, *vide* p. 31.

Total number of males and females : 46.

Average number per haul : 3.29.

Average size : 4.82.

### No. 5.

Date : 3/8/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Smooth. Wind : Calm.

Depth : 6½ fathoms. Temperature : 58°.

#### *Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell . . . . 1 2 10 19 12 27

Total : 71. Average number per haul : 5.07.

Average size : 6.18.

#### *Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell . . . . . 5 4 2 . . . .

Total : 11. Average number per haul : .79.

Average size : 4.18.

Total number of males and females : 82.

Average number per haul : 5.85.

Average size : 5.91.

### No. 6.

Date : 10/8/16. Number of Hauls : 14.

Locality : S.E. Robben Island.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Choppy, S.W. Swell. Wind : N.E.

Depth : 6 fathoms. Temperature : 56°.

#### *Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell . . . . . 4 3 4 15

Total : 26. Average number per haul : 1.85.

Average size : 6.65.

#### *Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell . . . . . 4 . . . . .

Total : 4. Average number per haul : .286.

Average size : 3.5.

Total number of males and females : 30.

Average number per haul : 2.15.

Average size : 6.25.

## No. 7.

Date : 16/8/16. Number of Hauls : 14.

Locality : S.E. Robben Island.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Choppy, S.W. Swell. Wind : N.W.

Depth : 4 fathoms. Temperature : 58.5°.

*Male Crawfish.*

Size in inches	1+, 2+, 3+, 4+, 5+, 6+, 7+,
Hard old shell	... ... 1 2 1 .. ..

Total : 4. Average number per haul : 29.

Average size : 4.5.

*Female Crawfish.*

Size in inches	1+, 2+, 3+, 4+, 5+, 6+, 7+,
Hard old shell	... ... 4 59 16 2 .. ..

Total : 81. Average number per haul : 5.8.

Average size : 3.67.

Total number of males and females : 85.

Average number per haul : 6.

Average size : 3.73.

## No. 8.

Date : 17/8/16. Number of Hauls : 14.

Locality : Off Milnerton (Hotel).

Nature of Bottom : Rocks.

Condition of Sea : S.W. Swell. Wind : Calm.

Depth : 7 fathoms. Temperature : 59°.

*Male Crawfish.*

Size in inches	1+, 2+, 3+, 4+, 5+, 6+, 7+,
Hard old shell	... ... 12 29 6 13 5 4

Total : 69. Average number per haul : 4.9.

Average size : 4.23.

*Female Crawfish.*

Size in inches	1+, 2+, 3+, 4+, 5+, 6+, 7+,
Hard old shell	... ... 3 34 9 7 .. ..

In berry	... ... .. .. 1 .. ..
----------	-----------------------

Total : 54. Average number per haul : 3.85.

Average size : 3.99.

Total number of males and females : 123.

Average number per haul : 8.79.

Average size : 4.09.

## No. 9.

Date : 22/8/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Very rough with heavy westerly swell.

Wind : N.W.

Depth : 8 fathoms. Temperature : 60°.

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*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
 Hard old shell ... ... 3 1 .. .. .. ..

Total : 4. Average number per haul : 285.

Average size : 2.75.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
 Hard old shell ... ... 4 .. .. .. ..

Total : 4. Average number per haul : 285.

Average size : 2.5.

Total number of males and females : 8.

Average number per haul : 571.

Average size : 2.62.

Remarks : Nets contained weed and were sandy.

## No. 10.

Date : 29/8/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Smooth. Wind : E.

Depth : 5 fathoms. Temperature : 59.8°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. 5 7 8 2 3 2 2

Total : 29. Average number per haul : 2.07.

Average size : 3.65.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
 Hard old shell ... ... 10 3 .. .. .. ..

Total : 13. Average number per haul : 93.

Average size : 2.7.

Total number of males and females : 42.

Average number per haul : 3.

Average size : 3.35.

## No. 11.

Date : 31/8/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Smooth. Wind : E.

Depth : 6 fathoms. Temperature : 60°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. 3 48 9 1 .. .. ..

Total : 62. Average number per haul : 4.43.

Average size : 2.59.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
 Hard old shell ..3 25 4 .. .. .. .. ..  
 Total : 32. Average number per haul : 2.29.  
 Average size : 2.53.  
 Total number of males and females : 94.  
 Average number per haul : 6.07.  
 Average size : 2.63.

## No. 12.

Date : 12/9/16. Number of Hauls : 14.  
 Locality : Off Milnerton. Nature of Bottom : Rocks.  
 Condition of Sea : Smooth. Wind : N.  
 Depth : 6 fathoms. Temperature : 59.5°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
 Hard old shell ..4 20 9 2 2 1 3 ..  
 Total : 41. Average number per haul : 2.92.  
 Average size : 3.31.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell ..5 8 1 .. .. .. .. ..  
 Total : 14. Average number per haul : 1. ..  
 Average size : 2.21.  
 Total number of males and females : 55.  
 Average number per haul : 3.92.  
 Average size : 3.04.

Remarks : Many small crawfish escaped through the meshes of the nets.

## No. 13.

Date : 15/9/16. Number of Hauls : 14.  
 Locality : Off Milnerton. Nature of Bottom : Rocks.  
 Condition of Sea : Smooth. Wind : N.W.  
 Depth : 5 fathoms. Temperature : 59.8°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell ..2 20 8 .. .. .. 1 ..  
 Total : 31. Average number per haul : 2.21.  
 Average size : 2.84.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell ..2 17 3 .. .. .. ..  
 Total : 22. Average number per haul : 1.57.  
 Average size : 2.63.

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Total number of males and females : 53.

Average number per haul : 3.78.

Average size : 2.75.

Remarks : Many small crawfish escaped through the meshes of the nets.

No. 14.

Date : 21/9/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Choppy. Wind : S.E.

Depth : 3 fathoms. Temperature : 60°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell ... 1 5 8 1 4 3

Total : 23. Average number per haul : 1.64.

Average size : 4.87.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell ... .. 1 3 1 .. ..

Soft old shell ... .. .. .. 1 .. ..

In berry ... .. .. 1 .. .. ..

Total : 7. Average number per haul : .5.

Average size : 4.43.

Total number of males and females : 30.

Average number per haul : 2.14.

Average size : 4.77.

No. 15.

Date : 26/9/16. Number of Hauls : 14.

Locality : S.E. Robben Island.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Smooth. Wind : N.

Depth : 6 fathoms. Temperature : 60°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell ... 1 19 12 2 .. ..

Total : 34. Average number per haul : 2.43.

Average size : 3.64.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell ... .. .. 1 .. .. ..

Total : 1. Average number per haul : .072.

Average size : 4.5.

Total number of males and females : 35.

Average number per haul : 2.5.

Average size : 3.94.

## No. 16.

Date : 29/9/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Choppy. Wind : W.

Depth : 6 fathoms. Temperature : 58.5°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+

Hard old shell ..5 4 5 .. .. .. ..

Total : 14. Average number per haul : 1.

Average size : 2.5.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+

Hard old shell ..3 2 3 .. .. .. ..

Total : 8. Average number per haul : .57.

Average size : 2.6.

Total number of males and females : 22.

Average number per haul : 1.57.

Average size : 2.54.

Remarks : A number of small crawfish escaped through the meshes of the nets.

## No. 17.

Date : 6/10/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Choppy. Wind : S.E.

Depth : 6 fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+

Hard old shell ... .. 14 .. .. .. ..

Total : 14. Average number per haul : 1.

Average size : 2.5.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+

Hard old shell ... .. 33 .. .. .. ..

Soft old shell ... .. .. 1 .. .. .. ..

In berry ... .. .. 3 .. .. .. ..

Total : 37. Average number per haul : 2.64.

Average size : 2.4.

Total number of males and females : 51.

Average number per haul : 3.64.

Average size : 2.35.

Remarks : A number of small crawfish escaped through the meshes of the nets.

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## No. 18.

Date : 9/10/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Very Rough. Wind : S.E. gale.

Depth : 8 fathoms. Temperature : 60°.

*Male Crawfish.*Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell ... 19 .. 3 1 .. 1

Total : 24. Average number per haul : 1.71.

Average size : 3.08.

*Female Crawfish.*Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell ... 20 .. .. .. .. ..

In berry ... .. .. 5 2 1 .. ..

Total : 28. Average number per haul : 2.

Average size : 2.92.

Total number of males and females : 52.

Average number per haul : 3.71.

Average size : 3.

Remarks : A number of small crawfish escaped through the meshes of the nets.

## No. 19.

Date : 12/10/16. Number of Hauls : 14.

Locality : 1 mile S.E. Whale Rock.

Nature of Bottom : Rocks.

Condition of Sea : Moderate. Wind : N.W.

Depth : 10½ fathoms. Temperature : 59.8°.

*Male Crawfish.*Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell ... .. 11 61 10 2 1

Total : 85. Average number per haul : 6.07.

Average size : 4.56.

*Female Crawfish.* (None).

## No. 20.

Date : 17/10/16. Number of Hauls : 14.

Locality :  $\frac{3}{4}$  mile E. Whale Rock.

Nature of Bottom : Rocks.

Condition of Sea : Slight. Wind : S.

Depth : 7½ fathoms. Temperature : 54.5°.

*Male Crawfish.*Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+,  
Hard old shell ... .. 12 9 6 4 4

Total : 35. Average number per haul : 2.5.

Average size : 4.88.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
In berry	....	..	8	7	..	..	..
Total	15.						
Average size	3.93.						
Total number of males and females	50.						
Average number per haul	3.57.						
Average size	4.6.						

## No. 21.

Date: 20/10/16. Number of Hauls: 14.

Locality: Off Milnerton. Nature of Bottom: Rocks.

Condition of Sea: Smooth. Wind: N.W.

Depth: 3 fathoms. Temperature: 56.2°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	....	..	3	4	..	..	..
Soft new shell	13	8	..	..	..	..	..
Total	28.						
Average size	2.42.						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Soft new shell	11	12	..	..	..	..	..
In berry	....	..	1	9	1	..	..
Total	34.						
Average size	2.43.						
Average size	2.79.						
Total number of males and females	62.						
Average number per haul	4.43.						
Average size	2.63.						

## No. 22.

Date: 23/10/16. Number of Hauls: 14.

Locality: Off Milnerton. Nature of Bottom: Rocks.

Condition of Sea: Slight. Wind: S.W.

Depth: 6½ fathoms. Temperature: 56°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Soft new shell	..	3	7	..	..	..	..
Total	10.						
Average size	2.2.						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Soft old shell	....	..	1	1	..	..	..
Soft new shell	5	4	..	..	..	..	..
In berry	....	..	2	..	..	..	..

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Total : 13. Average number per haul : 92.  
 Average size : 2.46.  
 Total number of males and females : 23.  
 Average number per haul : 1.64.  
 Average size : 2.34.

## No. 23.

Date : 1/11/16. Number of Hauls : 14.  
 Locality : Whale Rock W.S.W.  $1\frac{1}{2}$  mile.  
 Nature of Bottom : Rocks.  
 Condition of Sea : S.W. Swell. Wind : W.  
 Depth : 11 fathoms. Temperature : 56.4°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	36	76	53	33	25
Total	223						
Average size	5.21						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
In berry	..	..	..	1	..	..	..
Total	1						
Average size	4.5						
Total number of males and females	224						
Average number per haul	16						
Average size	5.18						

## No. 24.

Date : 8/11/16. Number of Hauls : 14.  
 Locality : Mouille Point Light House S.  $\frac{3}{4}$  mile.  
 Nature of Bottom : Sand and Weeds.  
 Condition of Sea : S.W. Swell. Wind : S.E.  
 Depth : 11 fathoms. Temperature : 52°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Soft new shell	..	..	99	34	25	11	7
Total	176						
Average size	4.32						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	..	12	..	..	..
Soft new shell	..	..	11	..	..	..	..
Total	23						
Average size	4						
Total number of males and females	199						
Average number per haul	14.5						
Average size	4.28						

## No. 25.

Date : 10/11/16. Number of Hauls : 14.

Locality : Mouille Point Light House S. 1 mile.

Nature of Bottom : Sand.

Condition of Sea : S.W. Swell. Wind : W.

Depth : 13 fathoms. Temperature : 54·4°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Soft new shell	..	..	61	28	12	10	6

Total : 117. Average number per haul : 8·35.

Average size : 4·40.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	1	3	..	..	..
Soft old shell	..	..	..	1	..	..	..
Soft new shell	..	..	21	9	..	..	..

Total : 35. Average number per haul : 2·5.

Average size : 3·68.

Total number of males and females : 153.

Average number per haul : 10·40.

Average size : 4·21.

## No. 26.

Date : 14/11/16. Number of Hauls : 14.

Locality : Robben Island and Mainland.

Nature of Bottom : Sandy.

Condition of Sea : S.W. Swell. Wind : S.W.

Depth : 14 fathoms. Temperature : 54·5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	..	17	..	..	..

Total : 17. Average number per haul : 1·21.

Average size : 4·5.

*Female Crawfish.* (None).

## No. 27.

Date : 16/11/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Smooth. Wind : N.W.

Depth : 7 fathoms. Temperature : 55·5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	4	1	1	1	..	..	..
Hard new shell	4	..	..	..	..	..	..
Soft old shell	..	1	..	..	..	..	..
Soft new shell	1	6	..	..	..	..	..

Total : 19. Average number per haul : 1·35.

Average size : 2·15.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	2	5	..	..	..	..	..
Hard new shell	..	2	..	..	..	..	..
Soft old shell	3	2	..	..	..	..	..
Soft new shell	..	3	..	..	..	..	..

Total : 17. Average number per haul : 1.21.

Average size : 2.17.

Total number of males and females : 36.

Average number per haul : 2.57.

Average size : 2.16.

## No. 28.

Date : 24/11/16. Number of Hauls : 14.

Locality : Green Point Light House S. 1 mile.

Nature of Bottom : Rocks.

Condition of Sea : Heavy S.W. Swell. Wind : W.

Depth : 14 fathoms. Temperature : 59.5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Soft old shell	..	..	2	3	..	..	..
Total	5						

Total : 5. Average number per haul : .357.

Average size : 4.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Soft new shell	..	..	2	2	..	..	..
Total	4						

Total : 4. Average number per haul : .285.

Average size : 4.

Total number of males and females : 9.

Average number per haul : .642.

Average size : 4.

## No. 29.

Date : 28/11/16. Number of Hauls : 14.

Locality : Green Point Light House, S.E. 1 mile.

Nature of Bottom : Rocks.

Condition of Sea : S.W. Swell. Wind : W.

Depth : 14 fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	..	1	..	..	..
Soft new shell	..	..	2	2	..	..	..

Total : 5. Average number per haul : .357.

Average size : 4.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Soft new shell	..	..	4	7	..	..	..

Total : 11. Average number per haul : 785.

Average size : 4.09.

Total number of males and females : 16.

Average number per haul : 1.14.

Average size : 4.06.

No. 30.

Date : 5/12/16. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Choppy. Wind : N.W.

Depth : 8 fathoms. Temperature : 58.5°.

*Male Crawfish.*

Size in inches	1 +	2 +	3 +	4 +	5 +	6 +	7 +
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Hard old shell	..	9	..	..	..	..	..
----------------	----	---	----	----	----	----	----

Hard new shell	5	29	..	..	..	..	..
----------------	---	----	----	----	----	----	----

Total : 40. Average number per haul : 2.85.

Average size : 2.45.

*Female Crawfish.*

Size in inches	1 +	2 +	3 +	4 +	5 +	6 +	7 +
----------------	-----	-----	-----	-----	-----	-----	-----

Hard old shell	..	11	..	..	..	..	..
----------------	----	----	----	----	----	----	----

Hard new shell	5	23	..	..	..	..	..
----------------	---	----	----	----	----	----	----

Total : 39. Average number per haul : 2.78.

Average size : 2.37.

Total number of males and females : 79.

Average number per haul : 5.63.

Average size : 2.4.

Remarks : A number of small crawfish escaped through the meshes of the nets.

No. 31.

Date : 12/12/16. Number of Hauls : 14.

Locality : Robben Island,  $\frac{1}{2}$  mile North of Jetty.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Rough. Wind : N.W.

Depth : 7 fathoms. Temperature : 58.5°.

*Male Crawfish. (None).*

*Female Crawfish.*

Size in inches	1 +	2 +	3 +	4 +	5 +	6 +	7 +
----------------	-----	-----	-----	-----	-----	-----	-----

In berry	..	..	27	48	7	..	..
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Total : 82. Average number per haul : 5.85.

Average size : 4.25.

No. 32.

Date : 20/12/16. Number of Hauls : 14.

Locality : Robben Island Light House N.W.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Smooth. Wind : W.

Depth : 8 fathoms. Temperature : 60.5°.

*Male Crawfish. (None).*

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
In berry	..	..	14	31	16	..	..
Total	61.						
Average size	4.52.						

## No. 33.

Date : 28/12/16. Number of Hauls : 28 (14 in each place).  
 Locality : Bok Bay, (1) N. end, (2) S. end.  
 Nature of Bottom : Sand.  
 Condition of Sea : Moderate at first then very rough.  
 Wind : S.E. (moderate to hard gale).  
 Depth : 3 fathoms. Temperature : 58.5°.  
 (None Caught).

## No. 34.

Date : 3/1/17. Number of Hauls : 14.  
 Locality : N.E. of Green Point Light House.  
 Nature of Bottom : Rocks.  
 Condition of Sea : Slight. Wind : W.  
 Depth : 13 fathoms. Temperature : 64°.  
 (None Caught).

## No. 35.

Date : 5/1/17. Number of Hauls : 14.  
 Locality : Between Woodstock Pipes and "America" wreck.  
 Nature of Bottom : Sand.  
 Condition of Sea : Choppy. Wind : N.W.  
 Depth : 3 fathoms. Temperature : 58°.  
 (None Caught).

## No. 36.

Date : 8/1/17. Number of Hauls : 14.  
 Locality : Off Milton Road, Sea Point.  
 Nature of Bottom : Rocks.  
 Condition of Sea : Smooth. Wind : W.  
 Depth : 9 fathoms. Temperature : 59°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	9	5	3	2	..
Hard new shell	..	..	1	2	..	..	..
Soft new shell	..	..	..	2	..	..	..
Total	24.						
Average size	4.37.						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	3	13	28	4	..	..
Hard new shell	..	..	2	3	..	..	..
Soft old shell	..	..	..	1	..	..	..
Soft new shell	..	1	..	..	..	..	..
In berry	..	..	1	..	..	..	..

Total : 56. Average number per haul : 4.

Average size : 4.14.

Total number of males and females : 80.

Average number per haul : 5.71.

Average size : 4.21.

## No. 37.

Date : 10/1/17. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Slight. Wind : N.W.

Depth : 8 fathoms. Temperature : 58°.

(None Caught).

## No. 38.

Date : 12/1/17. Number of Hauls : 14.

Locality : Off Milton Road, Sea Point.

Nature of Bottom : Rocks.

Condition of Sea : S.W. Swell. Wind : W.

Depth : 9 fathoms. Temperature : 59°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	..	2	1	..	..
Hard new shell	..	..	8	6	1	1	..
Soft old shell	..	..	1	..	..	..	..
Soft new shell	..	..	3	1	2	..	..

Total : 26. Average number per haul : 1.85.

Average size : 4.26.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	3	6	4	..	..	..
Hard new shell	..	12	8	2	..	..	..
Soft old shell	..	..	1	..	..	..	..

Total : 36. Average number per haul : 2.57.

Average size : 3.2.

Average number per haul : 4.42.

Total number of males and females : 62.

Average size : 3.66.

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## No. 39.

Date: 16/1/17. Number of Hauls: 14.

Locality: Off Milton Road, Sea Point.

Nature of Bottom: Rocks.

Condition of Sea: S.W. Swell. Wind: W.

Depth: 10 fathoms. Temperature: 66°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	..	19	27	8	5	1
Soft new shell	..	..	..	2	..	..	..

Total: 62. Average number per haul: 4.42.

Average size: 4.53.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	2	11	17	6	1	..
In berry	..	..	1	1	..	..	..

Total: 39. Average number per haul: 2.75.

Average size: 4.28.

Total number of males and females: 101.

Average number per haul: 7.17.

Average size: 4.43.

## No. 40.

Date: 19/1/17. Number of Hauls: 14.

Locality: Off Milton Road, Sea Point.

Nature of Bottom: Rocks.

Condition of Sea: Moderate. Wind: W.

Depth: 8½ fathoms. Temperature: 56.5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	..	18	12	10	7	2
Soft new shell	..	..	..	2	..	..	..

Total: 51. Average number per haul: 3.64.

Average size: 4.72.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	11	14	2	..	..
Hard new shell	..	..	..	..	1	..	..
Soft old shell	..	..	..	1	..	..	..

Total: 29. Average number per haul: 2.07.

Average size: 4.24.

Total number of males and females: 80.

Average number per haul: 5.71.

Average size: 4.55.

## No. 41.

Date : 25/1/17. Number of Hauls : 14.

Locality : Off Milton Road, Sea Point.

Nature of Bottom : Rocks.

Condition of Sea : Moderate. Wind : W.

Depth : 9 fathoms. Temperature : 64°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
Hard new shell ... .. 15 16 6 .. ..

Soft new shell .. .. .. 2 .. .. ..

Total : 39. Average number per haul : 2.75.

Average size : 4.25.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
Hard old shell .. .. .. 2 3 .. ..

Hard new shell .. .. 18 10 7 .. ..

Total : 40. Average number per haul : 2.85.

Average size : 4.

Total number of males and females : 79.

Average number per haul : 5.61.

Average size : 4.12.

## No. 42.

Date : 3/2/17. Number of Hauls : 24\*.

Locality : Green Point Light House.

Nature of Bottom : Rocks.

Condition of Sea : Moderate. Wind : W.

Depth : 15-16 fathoms. Temperature : 59.5°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+, 8+  
Hard new shell ... .. 11 22 17 18 6 1

Total : 75. Average number per haul : 3.12.

Average size : 5.34

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
Hard new shell .. .. 13 14 4 .. ..

Total : 31. Average number per haul : 1.29.

Average size : 4.19.

Total number of males and females : 106.

Average number per haul : 4.41.

Average size : 5.

## No. 43.

Date : 9/2/17. Number of Hauls : 30.†

Locality : Oude Kraal. Nature of Bottom : Rocks.

Condition of Sea : Moderate. Wind : N.

Depth : 16-22 fathoms. Temperature : 54°.

\* These hauls were made in six different spots.

† Six hauls in five different spots.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	..	18	8	1	2	..
Total	29						
Average size	4.03						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	8	30	11	2	..	..
In berry	..	..	1	..	..	..	..
Total	52						
Average size	3.63						
Total number of males and females	81						
Average number per haul	2.69						
Average size	3.65						

## No. 44.

Date: 10/2/17. Number of Hauls: 24\*.

Locality: E. side Robben Island.

Nature of Bottom: Sand and Bamboo.

Condition of Sea: Smooth. Wind: N.W.

Depth: 5-6 fathoms. Temperature: 59.5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	..	1	8	4	..	..
Soft new shell	..	..	..	..	1	..	..
Total	14						
Average size	4.78						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	1	3	1	..	..	..
Total	5						
Average size	3.4						
Total number of males and females	19						
Average number per haul	·749						
Average size	4.42						

## No. 45.

Date: 10/3/17. Number of Hauls: 14.

Locality: S. end Clifton Bay.

Nature of Bottom: Sand and Bamboo.

Condition of Sea: Moderate. Wind: S.W.

Depth: 4 fathoms. Temperature: 58°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	2	6	4	2	2	3
Total	19						
Average size	4.73..						

\* Six hauls in four different spots.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	10	25	44	14	..	..
In eyed berry	..	1	1	1	..	..	..

Total : 96. Average number per haul : 6.85.

Average size : 4.14.

Total number of males and females : 115

Average number per haul : 8.21.

Average size : 4.24.

## No. 46.

Date : 17/3/17. Number of Hauls : 14.

Locality : S.E. Robben Island.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Heavy Westerly Swell. Wind : W.N.W.

Depth : 12 fathoms. Temperature : 60.5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	4	13	7	1	5

Total : 30. Average number per haul : 2.15.

Average size : 5.16.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	2	1	..	..	..

Total : 3. Average number per haul : 0.21.

Average size : 3.83.

Total number of males and females : 33.

Average number per haul : 2.36.

Average size : 5.04.

## No. 47.

Date : 24/3/17. Number of Hauls : 14.

Locality : Whale Rock W.  $\frac{1}{2}$  N.,  $2\frac{1}{4}$  miles.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Moderate. Wind : W.

Depth : 14 fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	7	11	10	..	2

Total : 30. Average number per haul : 2.14.

Average size : 4.8.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
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Hard old shell	..	..	..	1	..	..	..
----------------	----	----	----	---	----	----	----

Hard new shell	..	4	14	19	..	..	..
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Total : 38. Average number per haul : 2.71.  
 Average size : 3.65.  
 Total number of males and females : 68.  
 Average number per haul : 4.86.  
 Average size : 4.31.

## No. 48.

Date : 31/3/17. Number of Hauls : 14.  
 Locality : S.E. Robben Island.  
 Nature of Bottom : Sand and Bamboo.  
 Condition of Sea : Smooth. Wind : Calm.  
 Depth : 7 fathoms. Temperature : 60°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	2	8	15	6	3	..

Total : 34. Average number per Haul : 2.42.  
 Average size : 4.5.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	19	29	22	1	..	..

Total : 71. Average number per haul : 5.07.  
 Average size : 3.56.  
 Total number of males and females : 111.  
 Average number per haul : 7.49.  
 Average size : 3.65.

## No. 49.

Date : 7/4/17. Number of Hauls : 14.  
 Locality : S.E. Robben Island.  
 Nature of Bottom : Sand and Bamboo.  
 Condition of Sea : Moderate. Wind : N.W. (thick fog).  
 Depth : 10 fathoms. Temperature : 61°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	1	5	1	5	7

Total : 19. Average number per haul : 1.35.  
 Average size : 6.05.

*Female Crawfish.* (None).

## No. 50.

Date : 28/4/17. Number of Hauls : 14.  
 Locality : Whale Rock, S.W. 1 mile.  
 Nature of Bottom : Sand and Bamboo.  
 Condition of Sea : S.W. Swell. Wind : W.  
 Depth : 12 fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	2	2	4	4	..	..
Total :	12.	Average number per haul : .857.					
Average size :	4.33.						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	1	1	3	..	..	..
Total :	5.	Average number per haul : .357.					
Average size :	3.8.						
Total number of males and females :	17.						
Average number per haul :	1.21.						
Average size :	4.17.						

## No. 51.

Date : 16/5/17. Number of Hauls : 10.  
 Locality : (I) Woodstock Pipes.  
 Nature of Bottom : Sand and Weeds.  
 Condition of Sea : Smooth. Wind : Calm.  
 Depth : 2½ fathoms. Temperature : 59°.  
 (None Caught).

Note : In schedules 51 to 65 four nets constitute a haul and the average number per haul has accordingly been divided by 4 to afford a comparison with the results given in the other schedules.

## No. 52.

Date : 16/5/17. Number of Hauls : 10.  
 Locality : (H). Salt River Mouth  
 Nature of Bottom : Rocks and Weeds.  
 Condition of Sea : Choppy. Wind : S.E.  
 Depth : 8 fathoms. Temperature : 59°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	3	2	1	1	1	1
Total :	9.	Average number per haul : .225.					
Average size :	4.22.						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	3	..	..	..	..
Total :	3.	Average number per haul : .075.					
Average size :	3.5.						
Total number of males and females :	12.						
Average number per haul :	.3.						
Average size :	4.08.						
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## No. 53.

Date : 16/5/17. Number of Hauls : 10.  
 Locality : (G) New River Mouth  
 Nature of Bottom : Rocks.  
 Condition of Sea : Choppy. Wind : S.E.  
 Depth : 8½ fathoms. Temperature : 59°.  
 (None Caught).

## No. 54.

Date : 16/5/17. Number of Hauls : 10.  
 Locality : (F) Blaauwberg Strand  
 Nature of Bottom : Rocks.  
 Condition of Sea : Choppy. Wind : S.E.  
 Depth : 9 fathoms. Temperature : 59°.  
 (None Caught).

## No. 55.

Date : 18/5/17. Number of Hauls : 10.  
 Locality : (E) Blaauwberg Strand  
 Nature of Bottom : Rocks.  
 Condition of Sea : Smooth. Wind : W.  
 Depth : 9 fathoms. Temperature : 58.5°.

*Male Crawfish.*

Size in inches	1 +,	2 +,	3 +,	4 +,	5 +,	6 +,	7 +
Hard old shell	..	..	..	..	7	6	11
Total :	24.	Average number per haul : .6.					
Average size :	6.66.						

*Female Crawfish.* (None).

## No. 56.

Date : 18/5/17. Number of Hauls : 10.  
 Locality : (D) Between Robben Island and Mainland.  
 Nature of Bottom : Sand.  
 Condition of Sea : Smooth. Wind : W.  
 Depth : 10 fathoms. Temperature : 58°.  
 (None Caught).

## No. 57.

Date : 18/5/17. Number of Hauls : 10.  
 Locality : (B) Robben Island N.E. of Jetty.  
 Nature of Bottom : Sand and Bamboo.  
 Condition of Sea : Smooth. Wind : W.  
 Depth : 7 fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches	1 +,	2 +,	3 +,	4 +,	5 +,	6 +,	7 +
Hard new shell	..	1	2	7	1	6	2
Total :	19.	Average number per haul : .475.					
Average size :	5.26.						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	2	14	9	4	..	..

Total : 29. Average number per haul : .725.

Average size : 3.86.

Total number of males and females : 48.

Average number per haul : 1.2.

Average size : 4.41.

## No. 58.

Date : 30/5/17. Number of Hauls : 8.

Locality : (L) Oude Kraal. Nature of Bottom : Rocks.

Condition of Sea : Rough. Wind : N.W.

Depth : 20 fathoms. Temperature : 54°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	3	44	17	8	..	..

Total : 72. Average number per haul : 1.5.

Average size : 4.91.

*Female Crawfish. (None).*

## No. 59.

Date : 4/6/17. Number of Hauls : 8.

Locality : (K) Clifton. Nature of Bottom : Rocks.

Condition of Sea : S.W. Swell. Wind : W.

Depth : 9 fathoms. Temperature : 56°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	2	9	9	2	..	..

Total : 22. Average number per haul : .687.

Average size : 4.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	..	4	2	..	..	..

Soft new shell	..	..	..	1	..	..	..
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In berry	..	..	4	8	2	..	..
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Total : 21. Average number per haul : .655.

Average size : 4.21.

Total number of males and females : 43.

Average number per haul : 1.34.

Average size : 4.1.

## No. 60.

Date : 4/6/17. Number of Hauls : 8.

Locality : (J) Green Point. Nature of Bottom : Rocks.

Condition of Sea : S.W. Swell. Wind : W.

Depth : 12 fathoms. Temperature : 56°.

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*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	..	..	..	..	1
Total : 1.	Average number per haul : .031.						
Average size : 7.5.							

*Female Crawfish.—(None).*

## No. 61.

Date : 4/6/17. Number of Hauls : 4.  
 Locality : Grainger Bay (Near Breakwater).  
 Nature of Bottom : Sand.  
 Condition of Sea : Smooth. Wind : W.  
 Depth : 6 fathoms. Temperature : 56°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	7	4	2	2	2	..
Hard new shell	..	64	22	30	33	..	..
Soft old shell	..	..	..	1	..	..	..
Soft new shell	..	..	1	..	..	..	..
Total : 168.	Average number per haul : 10.5.						
Average size : 3.72.							

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	5	4	3	3	..	..
Hard new shell	..	81	50	36	4	..	..
In berry	..	..	..	2	6	..	..
Total : 194.	Average number per haul : 12.12.						
Average size : 3.4.							
Total number of males and females : 362.							
Average number per haul : 22.17.							
Average size : 3.5.							

## No. 62.

Date : 5/6/17. Number of Hauls : 8.  
 Locality : (C)  $\frac{1}{2}$  mile W. of Whale Rock.  
 Nature of Bottom : Sand and Bamboo.s  
 Condition of Sea : Rough. Wind : N.  
 Depth : 11 fathoms. Temperature : 56°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	..	..	..	..	3
Hard new shell	..	..	..	4	..	..	..
Total : 7.	Average number per haul : .218.						
Average size : 5.78.							

*Female Crawfish. (None).*

## No. 63.

Date : 5/6/17. Number of Hauls : 8.  
 Locality (A) 1 mile E. of Whale Rock.  
 Nature of Bottom : Sand and Bamboo.  
 Condition of Sea : Rough. Wind : N.  
 Depth : 9 fathoms. Temperature : 56°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	..	..	1	3	11
Hard new shell	..	5	11	22	16	7	3
Soft new shell	..	5	2	2	..	..	..

Total : 88. Average number per haul : 2.75.

Average size : 5.02.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	..	2	2	2	..	..
Soft new shell	..	..	1	..	2	..	..

Total : 9. Average number per haul : 2.28.

Average size : 4.38.

Total number of males and females : 97.

Average number per haul : 3.31.

Average size : 4.97.

## No. 64.

Date : 14/6/17. Number of Hauls : 8.

Locality : (I) Woodstock Pipes.

Nature of Bottom : Sand and Weeds.

Condition of Sea : Smooth. Wind : N.E.

Depth : 1½ fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	2	..	..	..	..
Hard new shell	24	60	..	..	..	..	..

Total : 86. Average number per haul : 2.68.

Average size : 2.24.

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	1	..	..	..	..
Hard new shell	18	48	..	..	..	..	..

Total : 67. Average number per haul : 2.09.

Average size : 2.31.

Total number of males and females : 153.

Average number per haul : 4.78.

Average size : 2.27.

Remarks : The female of 3ins. length was examined and the ovary was in an advanced stage.

A number of small crawfish escaped through the meshes of the nets.

## No. 65.

Date : 14/6/17. Number of Hauls : 8.  
 Locality : (K) Clifton. Nature of Bottom : Rocks.  
 Condition of Sea : Heavy S.W. Swell. Wind : E.  
 Depth : 12 fathoms. Temperature : 57°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	..	3	11	3	2	..
Total	19						
Average size	4.68						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard new shell	..	..	1	..	..	..	..
Soft new shell	..	..	..	..	2	..	..
In berry	..	..	27	9	4	..	..
Total	43						
Average size	4.01						
Total number of males and females	62						
Average number per haul	1.93						
Average size	4.19						

## No. 66.

Date : 6/7/17. Number of Hauls : 14.  
 Locality : 1 mile E. of Whale Rock.  
 Nature of Bottom : Sand.  
 Condition of Sea : W. Swell. Wind : Calm.  
 Depth : 8½ fathoms. Temperature : 56.5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	..	..	..	2	10
Total	12						
Average size	7.33						

*Female Crawfish.* (None).

## No. 67.

Date : 17/7/17. Number of Hauls : 14.  
 Locality : S. Robben Island Jetty.  
 Nature of Bottom : Sand and Bamboo.  
 Condition of Sea : Smooth. Wind : E.  
 Depth : 3 fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	1	21	2	..	..	..
Hard new shell	..	..	1	..	..	..	..
Total	27						
Average size	3.33						

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. 3 41 8 2 .. ..

Total : 54. Average number per haul : 3.85.

Average size : 3.66.

Total number of males and females : 81.

Average number per haul : 5.77.

Average size : 3.55.

## No. 68.

Date : 1/8/17. Number of Hauls : 14.

Locality : E. side Robben Island.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Moderate. Wind : W.

Depth : 7 fathoms. Temperature : 60°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. .. .. 10 3 3 1

Total : 17. Average number per haul : 1.21.

Average size : 5.17.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. .. 9 20 3 .. ..

Total : 32. Average number per haul : 2.28.

Average size : 4.31.

Total number of males and females : 49.

Average number per haul : 3.49.

Average size : 4.2.

## No. 69.

Date : 22/8/17. Number of Hauls : 14.

Locality : Off Milnerton. Nature of Bottom : Rocks.

Condition of Sea : Moderate. Wind : W.

Depth : 8 fathoms. Temperature : 58°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. 37 9 7 3 .. ..

Total : 56. Average number per haul : 4.

Average size : 3.07.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell 17 11 .. .. .. ..

Total : 28. Average number per haul : 2.

Average size : 1.5.

Total number of males and females : 84.

Average number per haul : 6.

Average size : 2.54.

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## No. 70.

Date : 30/8/17. Number of Hauls : 14.  
 Locality : Between Green Point and Breakwater.  
 Nature of Bottom : Rocks.  
 Condition of Sea : Moderate. Wind : W.  
 Depth : 12 fathoms. Temperature : 60°.  
 (None Caught).

Remarks : On this occasion the engine broke down which necessitated operations being conducted near home.

## No. 71.

Date : 26/9/17. Number of Hauls : 14.  
 Locality : S. Robben Island Jetty.  
 Nature of Bottom : Sand and Bamboo.  
 Condition of Sea : Smooth : Wind : W.  
 Depth : 3 fathoms. Temperature : 55°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	21	16	18	4	..	..
Total	59.					4.21.	
Average size	3.59.						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	5	..	..	..	..	..
Soft old shell	..	..	2	2	1	..	..
Total	10.					71.	
Average size	3.4.						
Total : number of males and females	69.						
Average number per haul	4.92.						
Average size	3.56.						

Remarks : Many dead crawfish with carapaces torn off floated by. Apparently being washed off the rocks at Robben Island.

## No. 72.

Date : 29/9/17. Number of Hauls : 14.  
 Locality : S.E. of Robben Island.  
 Nature of Bottom : Sand and Bamboo.  
 Condition of Sea : Smooth : Wind : W.  
 Depth : 3 fathoms. Temperature : 57.5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	11	13	5	3	..	..
Total	32.					2.28.	
Average size	3.81.						

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. 2 1 2 .. ..

Total : 5. Average number per haul : .35.

Average size : 3.5.

Total number of males and females : 37.

Average number per haul : 2.63.

Average size : 3.75.

## No. 73.

Date : 3/10/17. Number of Hauls : 14.

Locality : S. side Robben Island.

Nature of Bottom : Sand and Bamboo.

Condition of Sea : Smooth. Wind : W.

Depth : 10 fathoms. Temperature : 51°.

(None Caught).

Remarks : Water very clear and bottom quite distinct in a depth of 8 fathoms. Many crawfish were observed crawling about the bottom and round the nets, but none went on to the nets.

The temperature is the lowest recorded during operations.

## No. 74.

Date : 12/10/17. Number of Hauls : 14.

Locality : Off Rocklands, Sea Point.

Nature of Bottom : Rocks.

Condition of Sea : Smooth. Wind : W.

Depth : 6 fathoms. Temperature : 55°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. 1 1 .. 1 .. ..

Total : 3. Average number per haul : .21.

Average size : 4.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Hard old shell .. .. 2 3 1 .. ..

In berry .. 1 1 1 .. .. ..

In eyed berry .. .. .. 3 .. .. ..

Total : 12. Average number per haul : .85.

Average size : 4.16.

Total number of males and females : 15.

Average number per haul : 1.07.

Average size : 4.13.

## No. 75.

Date : 27/10/17. Number of Hauls : 14.

Locality : Rocklands, Sea Point.

Nature of Bottom : Rocks.

Condition of Sea : Choppy. Wind : S.W.

Depth : 9 fathoms. Temperature : 54°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	1	1	..	1	..	..
Total	3						
Average size	4						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	3	3	..	..	..
In berry	..	..	..	3	..	..	..
In eyed berry	..	..	..	..	1	..	..
Total	10						
Average size	4.2						
Total number of males and females	13						
Average number per haul	92						
Average size	4.15						

## No. 76.

Date: 2/11/17. Number of Hauls: 14.

Locality: Green Point. Nature of Bottom: Rocks.

Condition of Sea: Heavy S.W. Swell. Wind: W.

Depth: 14 fathoms. Temperature: 59°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	2	2	1	..	..
Total	5						
Average size	4.3						

*Female Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	16	9	1	..	..
In berry	..	..	4	4	2	..	..
Total	36						
Average size	4.02						
Total number of males and females	41						
Average number per haul	2.92						
Average size	4.09						

## No. 77.

Date: 9/11/17. Number of Hauls: 14.

Locality: Off Green Point Light House.

Nature of Bottom: Rocks.

Condition of Sea: S.W. Swell. Wind: W.

Depth: 14 fathoms. Temperature: 59.5°.

*Male Crawfish.*

Size in inches	1+	2+	3+	4+	5+	6+	7+
Hard old shell	..	..	4	2	5	..	..
Total	11						
Average size	4.59						

*Female Crawfish.*

Size in inches	1+,	2+,	3+,	4+,	5+,	6+,	7+
Hard old shell	..	..	16	9	3	..	..
In berry	..	..	4	5	2	..	..
In eyed berry	..	..	3	1	..	..	..

Total : 43. Average number per haul : 3.07.

Average size : 4.08.

Total number of males and females : 54.

Average number per haul : 3.85.

Average size : 4.18.

## No. 78.

Date : 27/11/17. Number of Hauls : 14.

Locality : Off Rocklands, Sea Point.

Nature of Bottom : Rocks.

Condition of Sea : Heavy S.W. Swell. Wind : W.

Depth : 12 fathoms. Temperature : 54°.

*Male Crawfish.*

Size in inches	1+,	2+,	3+,	4+,	5+,	6+,	7+
Hard old shell	..	..	..	..	..	..	1
Total	1	..	..	..	..	..	..

Total : 1. Average number per haul : .07.

Average size : 7.5.

*Female Crawfish.*

Size in inches	1+,	2+,	3+,	4+,	5+,	6+,	7+
Hard old shell	..	..	4	3	..	..	..
In eyed berry	..	..	..	..	2	..	..
Total	9	..	..	..	..	..	..

Total : 9. Average number per haul : .64.

Average size : 4.27.

Total number of males and females : 10.

Average number per haul : .71.

Average size : 4.6.

## No. 79.

Date : 21/11/17. Caught in trawl in drag of  $\frac{1}{2}$  hour.

Locality : Between Green Point Light House and Breakwater

Nature of Bottom : Mud and Sand.

Depth : 7 to 10 fathoms. Temperature : 54°.

*Male Crawfish.*

Size in inches	1+,	2+,	3+,	4+,	5+,	6+,	7+
Soft old shell	1	9	5	17	11	26	18
Total	87	..	..	..	..	..	..

Total : 87. Average size : 5.5.

*Female Crawfish.*

Size in inches	1+,	2+,	3+,	4+,	5+,	6+,	7+
Soft old shell	2	7	3	1	..	..	..
In berry	..	..	3	..	2	..	..

Total : 18. Average size : 3.16.

Total number of males and females : 105.

Average size : 5.13.

[C.P. 3—1918]

## No. 80.

Date: 9/11/17. Caught in trawl in drag of  $\frac{1}{2}$  hour.

Locality: Between Green Point Light House and Breakwater.

Nature of Bottom: Mud and Sand.

Depth: 7 to 11 fathoms. Temperature: 56°.

*Male Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Soft old shell .. 3 52 70 24 11 17

Total: 177. Average size: 4.71.

*Female Crawfish.*

Size in inches 1+, 2+, 3+, 4+, 5+, 6+, 7+  
 Soft old shell .. .. 26 16 5 .. ..

In berry .. .. 5 2 .. .. ..

Total: 54. Average size: 4.1.

Total number of males and females: 231.

Average size: 4.55.

## SYNOPSIS OF NUMBER AND DESCRIPTION OF CRAWFISH CAUGHT IN EXPERIMENTAL HAULS IN TABLE BAY FROM 10TH JULY, 1916, TO 27TH NOVEMBER, 1917.

DATE.	MALES.				FEMALES.				MALES AND FEMALES.												
	Hard Old Shell.	Hard New Shell.	Soft Old Shell.	Soft New Shell.	Total Number.	Average per Haul.	Average Size.	Hard Old Shell.	Hard New Shell.	Soft Old Shell.	Soft New Shell.	In Berry.	Total Number.	Average per Haul.	Average Size.	Total Number.	Average per Haul.	Average Size.			
1916.																					
10 July	5	..	..	..	5	1.25	5.7	..	..	..	..	..	..	..	..	5	1.25	5.7			
12 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
14 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
2 Aug.	26	..	..	..	26	1.85	5.3	20	..	..	..	..	..	..	..	20	1.43	4.2	46		
3 "	71	..	..	..	71	5.07	6.18	11	..	..	..	..	..	..	..	11	.79	4.18	82		
10 "	26	..	..	..	26	1.85	6.65	4	..	..	..	..	..	..	..	4	.29	3.5	30		
16 "	4	..	..	..	4	2.94	5	81	..	..	..	..	..	..	..	81	5.8	3.67	85		
17 "	69	..	..	..	69	4.9	4.23	53	..	..	..	..	..	..	..	1	54	3.85	3.99	123	
22 "	4	..	..	..	4	2.8	2.75	4	..	..	..	..	..	..	..	4	.28	2.5	8		
29 "	29	..	..	..	29	2.07	3.65	13	..	..	..	..	..	..	..	13	.93	2.7	42		
31 "	62	..	..	..	62	4.43	2.59	32	..	..	..	..	..	..	..	32	.29	2.53	94		
12 Sept.	41	..	..	..	41	2.92	3.31	14	..	..	..	..	..	..	..	14	1	.21	55		
15 "	31	..	..	..	31	2.21	2.84	22	..	..	..	..	..	..	..	22	1.57	2.63	53		
21 "	23	..	..	..	23	1.64	4.87	5	..	1	1	1	1	1	1	7	.5	4.43	30		
26 "	34	..	..	..	34	2.43	3.64	1	..	..	..	..	..	..	..	1	.07	4.5	35		
29 "	14	..	..	..	14	1	2.5	8	..	..	..	..	..	..	..	8	.57	2.6	22		
6 Oct.	14	..	..	..	14	1	2.5	33	..	1	1	3	37	2	64	2.4	51	3.64	2.35		
9 "	24	..	..	..	24	1.71	2.29	20	..	..	..	..	8	28	2	2.25	52	3.7	2.27		
12 "	85	..	..	..	85	6.07	4.56	..	..	..	..	..	..	..	..	..	..	85	6.074	5.56	
17 "	35	..	..	..	35	2.05	4.88	..	..	..	..	..	..	..	..	15	1.07	3.93	50		
20 "	7	..	..	..	21	2.8	2.42	..	..	..	..	23	11	34	2	43	2.79	62	4.432	2.63	
23 "	..	..	..	..	10	10	1.71	2.2	..	..	2	9	2	13	..	.93	2.46	23	1.64	2.34	
1 Nov.	223	..	..	..	223	15.92	5.21	..	..	..	..	1	1	1	1	..	.07	4.5	224	16	5.18
8 "	..	..	..	..	176	176	12.85	4.32	12	..	..	11	..	23	1	.65	4	199	14.5	4.28	
10 "	..	..	..	..	117	117	8.35	4.4	4	..	..	1	30	..	35	2.5	3.68	152	10.4	4.28	
14 "	17	..	..	..	17	1.21	4.5	..	..	..	..	..	..	..	..	..	..	17	1.21	4.5	
16 "	7	4	1	7	19	1.35	2.15	7	2	5	3	..	17	1	21	2.17	36	2.57	2.16		
24 "	..	..	..	5	..	5	.36	4	..	..	4	..	4	..	4	.28	4	9	.64	4	
28 "	..	1	..	..	4	5	.36	4	..	..	11	..	11	..	11	.78	4.09	16	1.04	4.06	

DATE.	MALES.						FEMALES.						MALES AND FEMALES.		
	Hard Old Shell.	Hard New Shell.	Soft Old Shell.	Soft New Shell.	Total Number.	Average per Haul.	Hard Old Shell.	Hard New Shell.	Soft Old Shell.	Soft New Shell.	In Berry.	Total Numbers.	Average per Haul.	Total Number.	Average Size.
															Average Size.
1916															
5 Dec.	9	34	..	..	43	3.07	2.45	11	28	..	39	2.78	2.37	82	.585 2.41
12 "	..	..	..	..	..	..	..	..	82	82	5.85	4.25	82	.585 4.25	
20 "	..	..	..	..	..	..	..	..	61	61	4.35	4.52	61	4.35 4.52	
28 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
1917															
3 Jan.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8 "	19	3	2	24	1.71	4.37	48	5	1	1	1	56	4	4.14	80 5.71 4.21
10 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12 "	3	16	1	6	26	1.85	4.26	13	22	1	..	36	2.57	3.22	62 4.42 3.66
16 "	..	16	..	2	62	4.42	4.53	..	37	..	2	39	2.75	4.28	101 7.17 4.43
19 "	..	49	..	2	51	3.64	4.72	1	27	1	..	29	2.07	4.24	80 5.71 4.55
25 "	..	37	..	2	39	2.75	4.25	5	35	..	..	40	2.85	4	79 5.61 4.12
3 Feb.	..	75	..	75	125	5.34	..	31	..	..	31	1.29	4.19	106 4.41 5.01	
9 "	..	29	..	29	..	96	4.03	51	..	1	52	1.73	3.63	81 2.69 3.05	
10 "	..	13	..	14	..	54	4.78	..	5	..	..	5	2.08	3.4	19 .75 4.42
10 Mar.	19	..	..	19	1	354	4.73	3	..	..	3	96	6.85	4.14	115 8.21 4.24
17 "	30	..	..	30	2	5	16	3	..	..	..	3	2	3.83	33 2.2 5.04
24 "	30	..	..	30	2	14	4.8	1	37	..	..	38	2.71	3.65	68 4.86 4.31
31 "	34	..	..	34	2	42	4.5	71	..	..	71	5.07	3.56	111 7.49 3.65	
7 April	19	..	..	19	1	356	5.05	..	..	..	..	..	..	..	19 1.35 6.05
28 "	12	..	..	12	..	86	4.33	5	..	..	5	3.36	3.8	17 1.22 4.17	
16 May	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16 "	9	..	..	9	225	4.22	3	..	..	..	3	0.75	3.5	12 3 4.08	
16 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18 "	24	..	..	24	6	6	6.66	..	..	..	..	..	..	..	24 6 6.66
18 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30 "	..	72	..	72	1	5	4.91	..	..	..	..	..	..	..	72 1.5 4.91
4 June	..	22	..	22	..	69	4	..	6	..	1	14	21	6.54.21	43 1.34 4.1
4 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4 "	17	149	1	1	168	10.5	3.72	15	171	..	8	194	12.12	3.4	362 2.21 3.5
5 "	3	4	..	7	..	22	5.78	..	..	..	..	..	..	..	7 .22 5.78
5 "	15	64	..	9	88	2.75	5.02	..	6	3	..	9	2.28	4.38	97 3.31 4.97
14 "	2	84	..	86	2	68	2.24	1	66	..	..	67	2.09	2.31	153 4.78 2.27
14 "	..	19	..	19	..	50	4.68	..	1	..	2	40	43	1.34 4.01	62 1.93 4.19
6 July	12	..	..	12	..	86	7.33	..	..	..	..	..	..	..	12 .86 7.33
17 "	26	1	..	27	1	92	3.33	54	..	..	..	54	3.85	3.66	81 5.77 3.55
1 Aug.	17	..	..	17	1	21	5.17	32	..	..	..	32	2.28	4.31	49 3.49 4.2
22 "	56	..	..	56	4	3	0.7	28	..	..	28	2	1.5	84 6 2.54	
30 "	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26 Sept.	59	..	..	59	4	21	3.59	5	..	5	..	10	71	3.4	69 4.92 3.56
29 "	32	..	..	32	2	28	3.81	5	..	..	5	3.35	3.5	37 2.63 3.75	
3 Oct.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12 "	3	..	..	3	..	21	4	6	..	..	6	12	85	4.16	15 1.07 4.13
27 "	3	..	..	3	..	21	4	6	..	..	4	10	71	4.2	13 .92 4.15
2 Nov.	5	..	..	5	..	35	4.3	26	..	..	10	36	2.57	4.02	41 2.92 4.09
9 "	11	..	..	11	..	78	4.59	28	..	..	15	43	3.07	4.08	54 3.85 4.18
27 "	1	..	..	1	..	07	7.5	7	..	..	2	9	64	4.27	10 .71 4.6

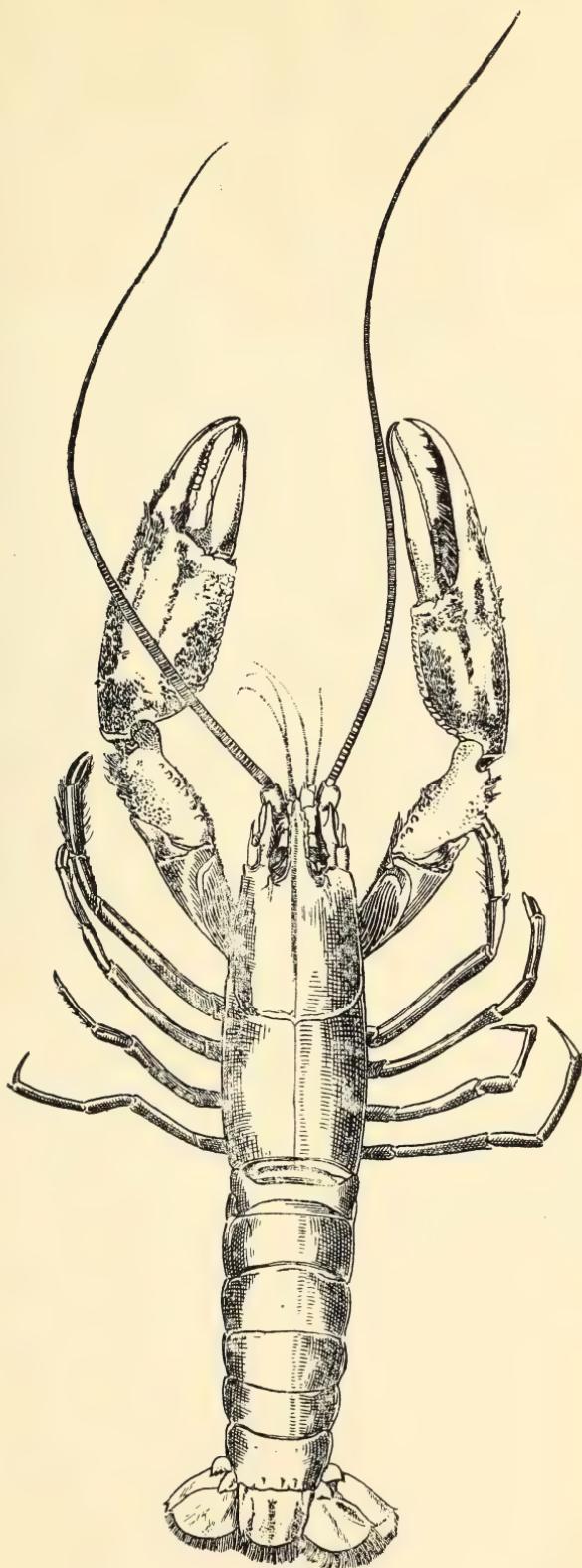
## II.—THE CAPE LOBSTER AND THE CAPE CRAWFISH OR SPINY LOBSTER.

With the increased prosperity of the Cape Crawfish Industry and placing of large quantities (over 14 million crawfish in 1917) of this article of food on the European Markets in the tinned condition the legitimate designation of the animal has become an important trade question, and the following account of the representatives of lobster and crawfish found in South Africa is drawn up by request to indicate the results of recent scientific investigations into this matter. Briefly these are that it has been established that a true lobster occurs, though rarely, in the South African seas, and that several species of crawfish have been found in addition to the ordinary Cape Crawfish or Kreeft.

### THE CAPE LOBSTER.

The first record of this crustacean was in 1796 by Herbst, who figured and described it as the "Cape Crayfish" *Cancer (Astacus) capensis*. He states that "this beautiful crab occurs at the Cape in mountain streams. It is similar indeed to our own common crayfish, but is more slender and of equal breadth throughout. It is coral red in colour, and has a beautiful sheen resembling the cornelian. Whether this is its natural colour or whether it is due to cooking I cannot decide. The appendages are relatively small. The base of the hand (carpus or fifth segment) nearly surpasses the arm (meros or fourth segment), and is strongly tuberculated; the hands are large and are bordered, moreover, with a very delicate raised and toothed margin, studded everywhere with yellowish, transparent hairs. The feet are all chelate, while in the common crayfish the first pair only have this character." This first account of the Cape lobster was the beginning of the trouble and doubt, which remained attached to the animal for the next hundred years. The statement that all the legs are provided with claws or chelae, and that the animal lives in mountain streams were the chief difficulties in the way of identifying this supposed crayfish.

The animal is again mentioned under the name *Astacus capensis* in 1803 by Latreille, and, in 1837, Milne-Edwards apparently decided that the chelate character of all the legs was an error of observation, for he regards it as a species of lobster, which he calls *Homarus capensis*. His description is as follows:—"Body slender. Rostrum flattened, much shorter than the peduncle of the outer antennae and finely denticulated on the edges. Wrist granular, hands elongate,



THE CAPE LOBSTER (*Homarus capensis*).



very compressed, furnished on the outer edge with a finely denticulate crest and covered with hairs above. Length about five inches." There is evidence that this description is from an actual specimen of the animal.

In 1841 de Haan mentioned *Homanus capensis* with little additional information, and in 1843 Krauss mentions it with no further details than that he had never seen it in Natal.

In 1878 Huxley wrote : "I must myself confess to be in a hopeless state of perplexity respecting the Crayfish or Lobster which is said to occur at the Cape of Good Hope." He thinks it impossible to suppose that Herbst could have made a mistake as to all the legs of the animal being chelate, and this is one of the chief stumbling blocks in the determination of the animal.

In 1895 Herrick thus refers to the Cape Lobster : "A third form *Homanus capensis* has been imperfectly described from the Cape of Good Hope, but it is doubtful if it belongs to this genus."

In the year 1890 I was fortunate in procuring two specimens of a lobster from shallow water at Sea Point, and forwarded them to the Rev. T. R. R. Stebbing, F.R.S., who was then working on the collection of crustacea made by the "Pieter Faure," and who at once surmised that this was the much misunderstood crayfish of Herbst. He thinks that the traces of a rich red colouring is a characteristic which combines with the general proportions and the structure of the front chelipeds to produce conviction that these specimens belong to the species described by Herbst, and "that they belong to the species described by Milne-Edwards there can be no doubt since they agree with his description at all points." He gives a full description of the animal, which leaves no doubt but that it is as much entitled to the designation "lobster" as the well known forms of the northern hemisphere, distinguished from them only by its small size, having body and claws and flattened hands of the front claws. He also mentions the colour (so far as was then known) as a distinguishing feature, but I have subsequently to this had an opportunity of noting that in the fresh state it is of a rather dark olive colour, not dissimilar to that of the Northern lobster.

Writing in 1912 of the Cape Lobster, Herrick says with reference to Stebbing's account : "At last the Cape Lobster thus emerges as a true species of small size and attractive appearance, and, like its more famous relatives in Europe and America, it lives only in salt water. It is sincerely hoped that zoologists will not have to wait another half century for an adequate account of both its habits and development."

He adds that, as if this form were doomed to confusion, the term *Astacus* has been applied to it along with other true lobsters, "but, since the decision of the International Commission was rendered in August, 1910, in favour of restricting

*Astacus* for the crayfishes and *Homarus* for the lobsters, it is hoped that this needless source of misunderstanding will be eventually removed."

The mystery of the Cape Lobster is thus cleared up, but it may be another half century or more before its habits and development are thoroughly investigated, as it is a very rare species, and is not even known to Cape Fishermen.

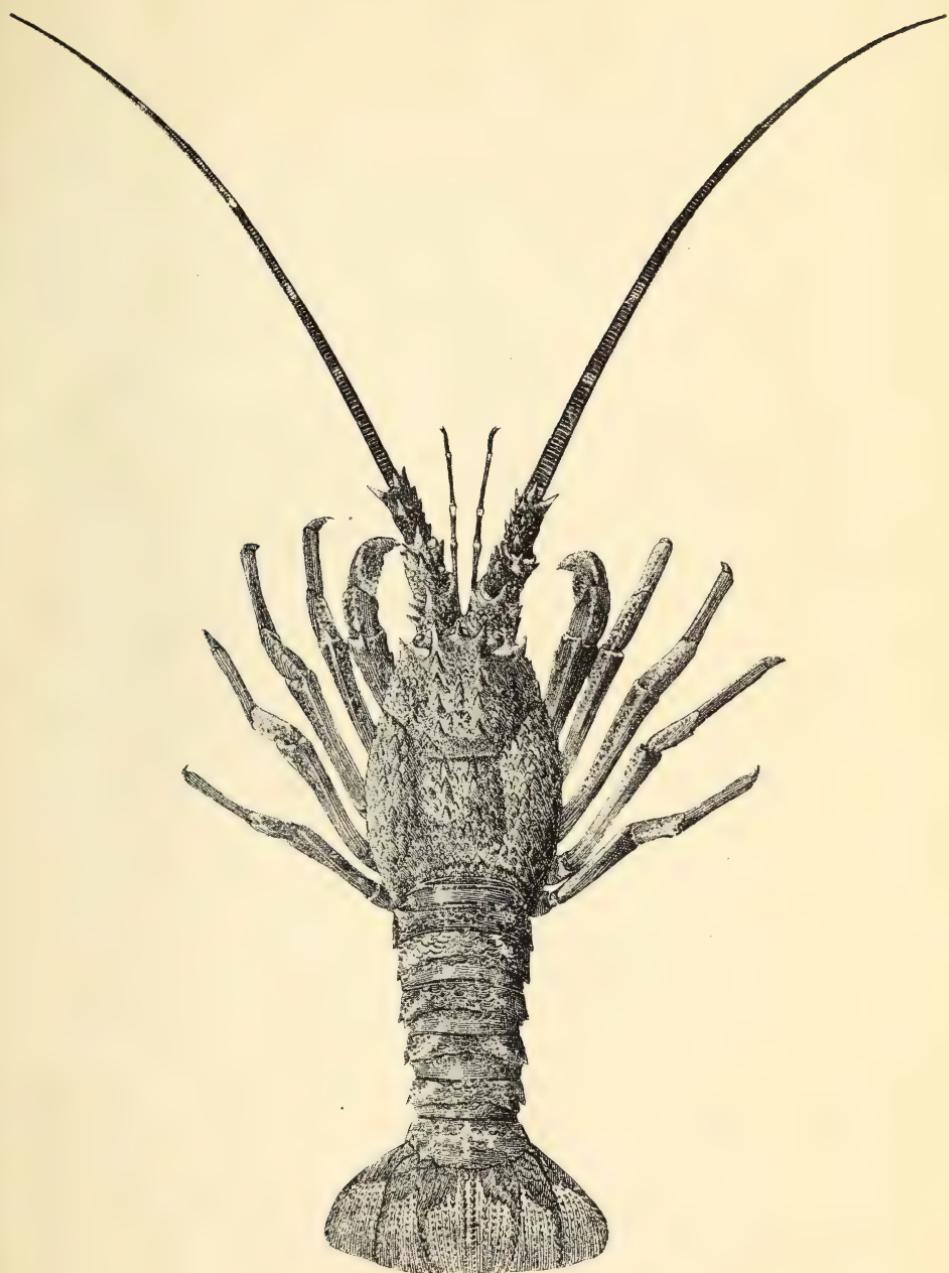
Only three species of the true lobster are at present known, and may without any doubt be included under the name *Homarus* or the trade term "Lobster." All are distinguished by their very large first legs. These are (1) the lobster found in America (*H. americanus*), (2) the lobster found in Europe (*H. gammarus* or *vulgaris*, to use a more familiar name), and (3) the lobster found in South Africa (*H. capensis*).

The only drawings of the Cape Lobster are an early one by Herbst, which is somewhat crude, and a later one, which is more accurate, by Milne-Edwards, published 15 years after his description (Ann. Sc. Nat. Zoologie Ser. 3, Vol. XV, 1837). The accompanying figure will give a general idea of the appearance of the animal.

There is one other lobster-like crustacean in South African seas. It was found off the Natal coast in about 400 fathoms by the "Pieter Faure," and is not known to occur in shallower water. It is allied to the so-called Norwegian Lobster found in Europe. Both differ from true lobsters in having the first legs of a smaller size. It is called *Nephropsis atlantica*, and is known from elsewhere in the Atlantic and Indian Oceans. It is at present of no direct economic value.

#### CRAWFISH OR SPINY LOBSTER.

The Cape Crawfish is the most important representative of this group in South Africa. It is known in South Africa under several names, such as Crayfish, Crawfish and Kreeft, the last being a name of a similar animal well known in Holland. All of these names have been derived from other countries where a similar fish is well known. The name Crayfish in England is usually applied to a small lobster-like animal found in fresh waters in Europe and elsewhere, but not in South Africa. To avoid confusion between the fresh water form and the marine form the latter is more accurately described as the "Sea Crayfish" or "Crawfish." The Dutch name "Kreeft," like the name "Crayfish," is also applied locally both to the fresh water and marine forms, but a distinction is also often drawn, the former being termed the "Rivier Kreeft" and the latter the "See Kreeft." The French make the distinction still more accurate by using the term "Langouste" for the marine form, and this name is also frequently used in Holland for the animal by the more educated classes. On account of its superficial resemblance to the lobster it has also been termed the "Spiny Lobster," by



THE CAPE CRAWFISH OR SPINY LOBSTER (*Jasus lalandii*).



which name it is known in England and America. The New Zealand species, which is believed to be identical with the Cape species, is known in that country as the "Crayfish" or "Marine Crayfish." It differs, however, from the true lobster, most obviously in the first claw being much smaller and devoid of pincers. It cannot, therefore, legitimately be called a lobster, nor can it be called the Cape Lobster, not only for this reason, but because, as we have already seen, there is a true Cape Lobster in the Cape seas. If it be desired to retain the name Lobster it may quite legitimately be termed the Cape Spiny Lobster or simply Spiny Lobster.

The spiny lobsters of South Africa seem to conform to the general rule as to the distribution of fishes, and probably other marine animals in South Africa, viz., on the West Coast the species are few in number, but the individuals are numerous, while on the East Coast the contrary is the case. This is doubtless connected with the occurrence of colder water on the west coast. Thus only one is found on the west coast, while there are eight on the east coast.

All these were at first put in one genus *Palinurus*, which is characteristic of the northern hemisphere, but in 1883, Parker sub-divided the genus into three sub-genera, *Palinurus*, *Jasus* and *Panulirus*, and pointed out that these could be placed in two sections, the first called "Silentes" on account of their having no rasping or stridulating organ. This includes the Cape crawfish, *Jasus*. The second section, called "Stridentes," on account of the presence of a stridulating organ, includes the other two, *Palinurus* and *Panulirus*. These sub-genera were subsequently recognised as distinct genera.

Of the genus *Jasus* only two representatives are known in South African seas, one the Cape crawfish on the west coast, chiefly in shallow water, and another found by the "Pieter Faure" on the east coast in deep water. The genus *Palinurus* is only represented by a single species on the south and east coasts. *Panulirus* is, however, represented by as many as six species, all confined, as far as is known, to the east coast.

In addition to the families of the Lobster and the Spiny Lobster, mention may be made of another family which may be called the Digging Lobster (*Scyllaridae*), as the shell is flattened, and the antennae are broad, shovel-like, and well adapted for digging in the sand. They are all found on the east coast, though stragglers may be found as near the west coast as False Bay, and they are not uncommonly got in the trawl in Mossel Bay. They occur in Natal in such numbers as to be of some economic value.

Mention may also be made of South African shrimps and prawns, the only one, however, of much economic value being a large prawn, which is found on the east coast.

Mr. K. H. Barnard, M.A., has at my request drawn up the following list of these various forms, with short, popular descriptions, which will enable the non-scientific reader to determine them. All the species may also be seen in the South African Museum at Cape Town.

## FAMILY I.—ASTACIDAE.

### *True Lobsters.*

Besides the true Lobsters, *Homard* of the French, this family includes a few other marine genera of lesser importance. The fresh-water Crayfish (French : *ecrevisse*), in spite of their name, are more closely allied to this family than to the following one. They are usually placed in a separate family.

The following characters are useful in distinguishing this family from the *Palinuridae* and *Scyllaridae* : legs with 7 joints ; the first enlarged and robust, ending in a strong pincer ; second and third pairs also ending in pincers ; first segment of the abdomen with appendages ; a pointed scale at the base of the long antennae.

### GENUS HOMARUS.

Eyes well developed. First pair of legs very large and strong.

Three species of Lobster are known—the European, the North American, and the Cape species.

#### *Homarus capensis.*

##### *The Cape Lobster.*

This species is distinguished from the two northern species by the thick hair on the hand of the first pair of legs, which are about equal in size. In the northern lobsters the leg on one side is usually larger than that on the other side.

Length : 4—5 inches.

Greenish or olive-brown.

It has been found in Table Bay and Algoa Bay, but is rare.

### GENUS NEPHROPSIS.

Eyes small and rudimentary, without pigment. First pair of legs not very large.

#### *Nephropsis atlantica.*

This species is allied to the Norwegian Lobster, *Nephrops norvegica*. It is only found in deep water, and is at once distinguished by the small eyes. The rostrum is very sharp, with two spines along each side and two or three more at its base.

Length : 3 inches.

Orange red.

Off the Natal coast, 400 fathoms. Also found in the Atlantic and Indian Oceans.

## FAMILY 2.—PALINURIDAE.

*Crayfishes or Spiny Lobsters.*

Crayfish, *Langouste* of the French, are found in many parts of the world, and form a valuable food-supply. The term "Spiny Lobster" is also used in contradistinction from the true Lobster. The first pair of legs is an unfailing means of distinguishing them; though frequently very stout in the larger Crayfishes, especially the males, it always ends in a simple claw, never in a pincer as in the true Lobsters.

Eight species live in South African waters. Only two are peculiar, namely, Gilchrist's and Parker's Crayfishes. Five of the others are at home in the warm waters of the Indian and Indo-Pacific Oceans, sending outposts down the east coast of Africa as far as Natal. The Common or Cape Crayfish inhabits the southern extremities of the southern continents, whose coasts are washed by the cold drift-currents from the Antarctic.

The following characters distinguish this family from the Lobsters: legs with six joints; the first pair not very much larger than the others, and ending in a simple claw; second and third pairs also ending in simple claws; first segment of the abdomen (tail) has no appendages; no pointed scale at the base of the long antennae.

Section I. A small pointed rostrum or beak above the bases of the long antennae which are close together, not separated by a smooth plate.

One genus with two species in South Africa. The Crayfish of this section are called "Silentes" because they are unable to make a rasping noise as do those of the next section.

GENUS **JASUS.****Jasus lalandii.***The Cape or Common Crayfish.*

The two horns are parallel and project forwards; the carapace bears spines and warts mixed with short hairs; the abdomen has a transverse groove on each segment and scaly ornamentation.

The males grow to a length (from rostrum to end of tail) of 16-18 inches, the females somewhat less.

Deep red-brown with purplish or greenish tinges on the tail-fan and paler patches on the abdomen; albino (white) specimens have been recorded.

Found along the west coast of South Africa, and occasionally in False Bay in shallow water; also on the coast of Chile, Tristan d'Acunha, and southern New Zealand.

[C.P. 3—1918]

**Jasus parkeri.***Parker's Crayfish.*

(Figured in Marine Investigations S.A. Vol. 2, pl. 6.)

The two horns point outwards as well as forwards ; the carapace has a double row of spines down the middle and a row at each side, the intervening surface smooth ; the abdomen has a ridge down the middle of the 1st-5th segments.

Length, 6 inches.

Orange or orange-red, the spines deeper in colour.

Found in deep water, 200-300 fathoms, off East London.

Section II. No rostrum above the bases of the long antennae, which are separated by a smooth plate (antennal plate). By rubbing the bases of the antennae against the edges of this plate, the animals making a rasping noise, and are called "Stridentes."

Two genera in South Africa.

**GENUS PALINURUS.**

Antennal plate narrow and unarmed with spines. The two lashes or feelers at the end of the short antennae (antennules) are short.

**Palinurus gilchristi.***Gilchrist's Crayfish.*

(Figured in Marine Investigations S.A. Vol. 1, pl. 1.)

Two large horns in front spreading out sideways. Carapace covered with spines and warts mixed with short hairs. Abdomen with two transverse hairy grooves on each of 2nd-5th segments.

Length  $8\frac{1}{4}$  inches.

Orange, banded with pale yellow on the antennae, legs and abdomen.

Found in False Bay, all over the Agulhas Bank and up the East coast as far as Natal, in 30-60 fathoms.

**GENUS PANULIRUS.**

Antennal plate broad and armed with spines. The feelers at the end of the antennules are long.

The five species of this genus found in South Africa may be distinguished as follows :

(a) *Segments of the abdomen transversely grooved.***Panulirus burgeri.***Burger's Crayfish.*

Antennal plate armed with four large spines forming a square within which are two smaller spines. The abdomen is ornamented with flat scale-like warts in addition to the groove.

Length,  $6\frac{1}{2}$  inches.

Preserved specimens are reddish-brown ; I have found no mention of the natural colouration in the works I have been able to consult.

Found in the shallow coastal water from Algoa Bay to Natal ; also in the Indo-Pacific Ocean.

### **Panulirus penicillatus.**

*The painted Crayfish.*

Antennal plate armed with four large spines arising close together in the middle of the plate. Abdomen without scale-like warts.

Length up to 18 inches.

Greenish or greenish-brown, with yellow markings, abdomen with small yellow spots, legs longitudinally striped with yellow.

Natal, East coast of Africa and Indo-Pacific Ocean.

The colloquial name here used refers not so much to the fact that "penicillum" means a brush, as to the brilliant and varied colouration, although certain other species are even more beautiful in this respect.

### **Panulirus japonicus.**

*Japanese or Long-legged Crayfish.*

Antennal plate armed with two large spines near the front margin, followed by four small ones across the middle. Abdomen without scale-like ornamentation. Second pair of legs unusually long.

Length up to 7 inches.

Purplish or reddish with yellow markings, abdomen with yellow bands, or a row of spots along the sides, legs with pale spots.

Natal, Madagascar and East African Islands, Japan, Hawaiian Islands.

(b) *Segments of the abdomen not grooved.*

### **Panulirus ornatus.**

*The ornate Crayfish.*

Antennal plate armed with four spines, forming a square within which are two small ones, the latter rudimentary or often absent. Abdomen smooth.

Length up to 15 inches.

Reddish or purplish, beautifully marbled with darker lines and spots on the front of the carapace and bases of long antennae, spines on carapace tipped with yellow, abdomen with pale spots along the sides and a dark band across each segment, legs and antennules banded with cream and dark red-brown.

Natal and Indian Ocean.

[C.P. 3—1918]

**Panulirus fasciatus.***The striped Crayfish.*

Antennal plate armed with four large spines forming a square. Abdomen smooth.

Length up to 12 inches.

Reddish-brown with cream-coloured lines and stripes, arranged lengthwise on the carapace and legs, crosswise on the abdomen, bases of long antennae mottled with cream and dark red.

Natal and Indian Ocean.

**FAMILY 3.—SCYLLARIDAE.**

The members of this family are not true Crayfish, but are closely allied. They possess the same distinguishing characters as the last family, but are at once separated by the broad and flattened carapace, with deep sockets for the eyes, and the short plate-like antennae (feelers).

The family is represented in most parts of the world, and the larger species are highly esteemed as an article for human consumption. Three species live in South African waters, one of which is of economic value.

**GENUS SCYLLARIDES.**

Carapace longer than broad. Eye-sockets midway between the middle line and the outer angles of the carapace.

**Scyllarides elizabethae.***The Port Elizabeth Crayfish.*

(Figured in Annals S.A. Museum, Vol. 6, pl. 30.)

This large species is peculiar to South Africa, inhabiting the Agulhas Bank in 20-60 fathoms.

Bright red, with a greyish tinge in places, the antennae edged with yellowish white, legs cream coloured with three purple bands.

It reaches a length of 9 inches (excluding the plate-like antennae).

**GENUS THENUS.**

Carapace broader than long. Eye-sockets at the extreme outer angles of the carapace.

**Thenus orientalis.**

This is a smaller form easily recognised by the position of the eyes.

Length, 7-8 inches.

Reddish-brown.

Natal and Indian Ocean.

## GENUS IBACUS.

Carapace broader than long, with a deep and narrow notch at the side. Eye-sockets near the middle line.

**Ibacus verdi.**

A single specimen of this species has been taken off East London. It was known previously from the Atlantic and Eastern Indian Oceans.

Length, 4-5 inches.

Reddish.

Other South African Crustacea of use to man as food, bait, etc.:

*Peneus monodon.*

*Penaeus caeruleus* (Fig. in Marine Investg. S.A. Vol. 4, pl. 21).

*Penaeus semisulcatus.*

*Penaeus japonicus.*

*Penaeus canaliculatus.*

*Penaeopsis monoceros.*

All these prawns occur from Natal or Algoa Bay up to Delagoa Bay.

The commonest shrimp, occurring from Mossel Bay up to Natal, appears to be *Macropetasma africanus*. Also several species of *Leander*.

Cracker-shrimps in Natal and elsewhere:

*Alpheus crassimanus.*

Other large-clawed Crustaceans from False Bay, etc.:

*Upogebia capensis.*

*Callichirus kraussi.*

Burrowing in the sand in Natal:

*Hippa (Emerita) emeritus.*

### III.—REPORT ON NETTINGS IN THE ZWARTKOPS RIVER.

The question of fishing in the Zwartkops River is one of the oldest difficulties in connection with fishing regulations in South Africa, and the first legislative measures dealing with fishery matters in this country was the Act of 1883, with regard to netting in the river. Since then various restrictions have from time to time been imposed on netting operations, and in the year 1912 it was resolved, as an experiment which might throw some light on the many disputed points which had arisen, to close the river for three years to netting, and in the meanwhile to attempt to discover by a series of experimental nettings and other observations what were the real facts of the case concerning which so diverse and conflicting statements were made. Unfortunately, chiefly for financial reasons, Government was not in a position to carry out these experiments. Towards the end of the year 1913 it was represented to the Government that there had been a great falling off of the fish in the river, and this was alleged to be so marked as to necessitate some restriction even on angling operations. A meeting of anglers and netters was called at Port Elizabeth on the 20th January, 1915, in order to procure evidence on this particular point. No definite proofs were available, however, though a resolution was carried by a large majority stating that it was the opinion of the meeting (composed, it is true, chiefly of anglers) that there had been no diminution, but rather an increase, of fish in the Zwartkops.

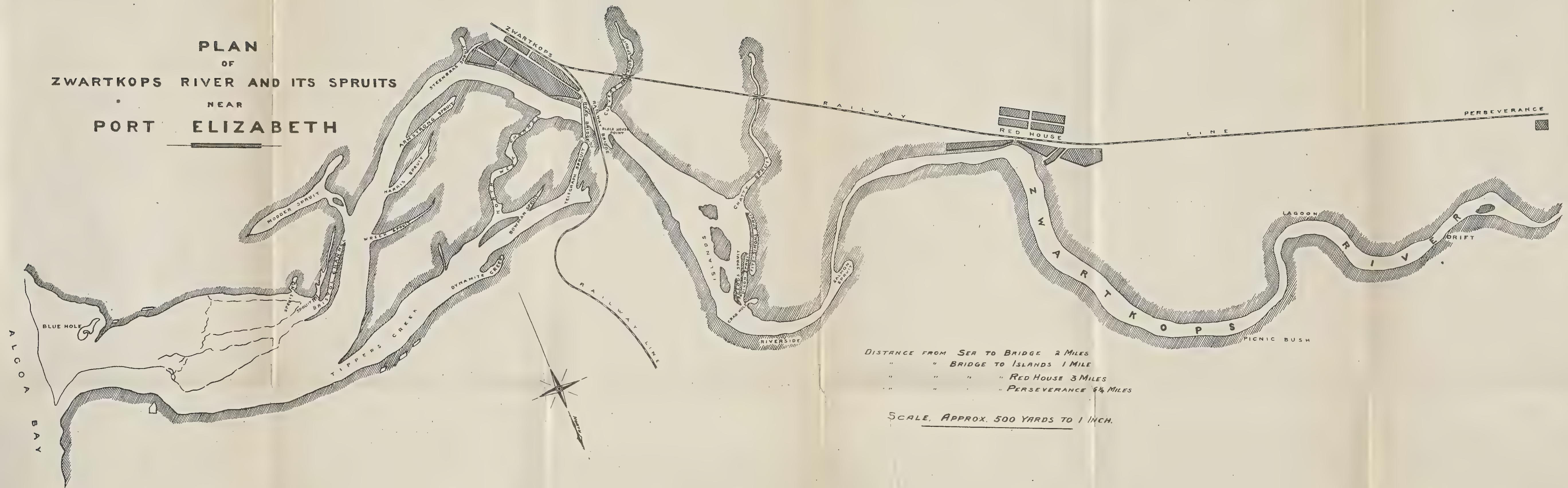
It was stated, however, that there had been a falling off of the supply of fish in the Bay, as also in the neighbouring Gamtoos and the Sundays Rivers. The decrease of fish in these rivers, however, was explained—in the Gamtoos, because a flood had brought down mud and covered the reef at the mouth, and in the Sundays River, because there had been no flood to clear away the sand bar. Salmon (*Elops*) and Barbel (*Galeichthys*) were, however, said to be scarcer in the Zwartkops. Other suggestions were that an increase of fish may be due to fewer motor launches being in the river, and that the reappearance of mussels, which had for ten or twelve years disappeared, had brought back the fish.

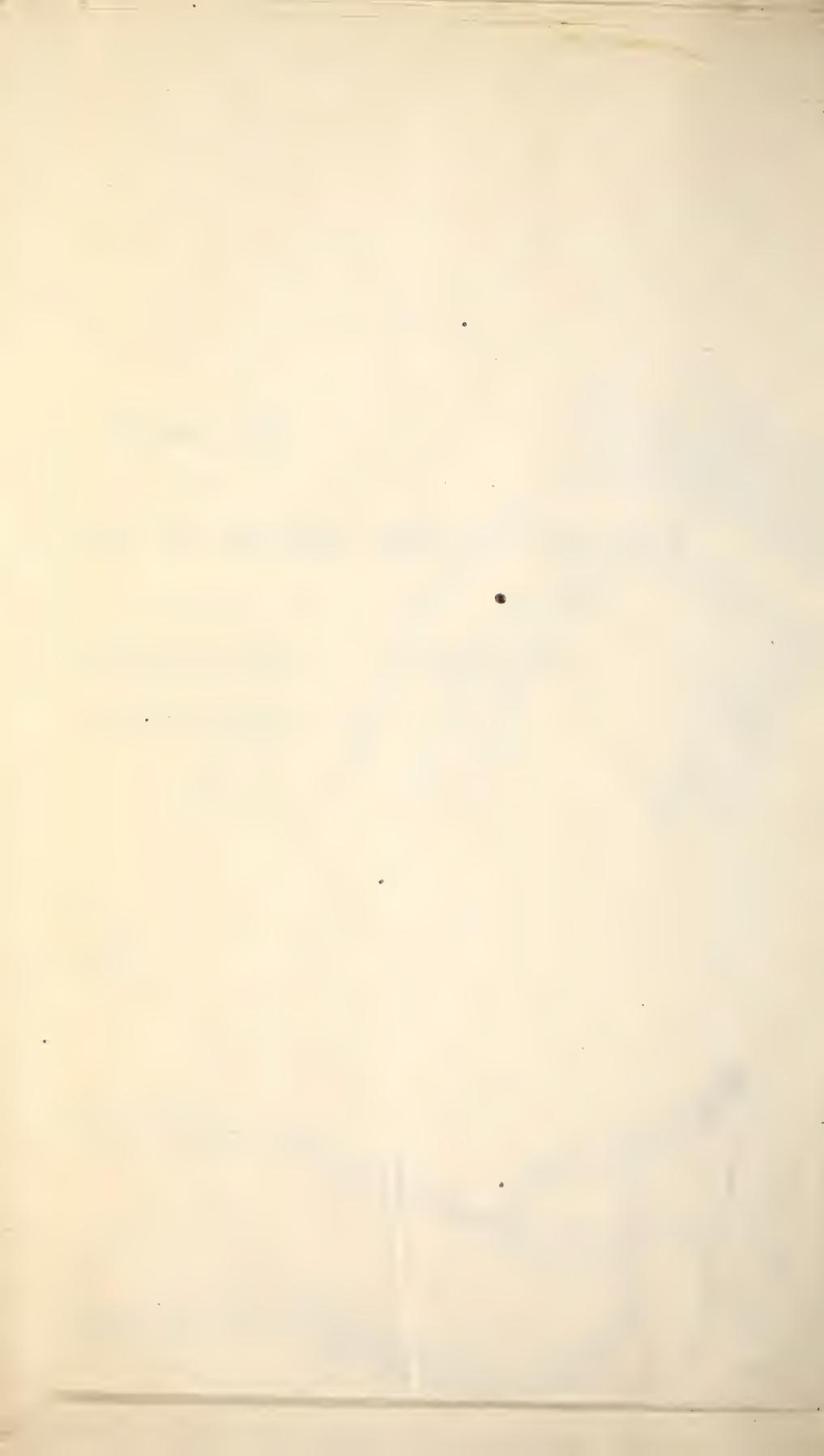
Though the proposed close season for angling was considered unnecessary, it was felt that some restrictions should be made in the form of a size limit, below which no fish were to be caught, and a committee was appointed to make suggestions in this direction.

1  
2  
3  
4



PLAN  
OF  
ZWARTKOPS RIVER AND ITS SPRUITS  
NEAR  
PORT ELIZABETH





Before, however, these proposals assumed a definite form the whole question again came up towards the expiry of the three years' probation, and the same conflicting statements were urged with additional warmth and with the additional argument, on the one hand, that the closure had resulted in an increase in number and size of fish and, on the other hand, that it had resulted in a decrease as there had been no netting to remove the vermin from the river.

Under those circumstances the only solution of the difficulty was obviously to carry out the experiments originally contemplated, and this the Government proposed to do.

At a meeting of anglers and netters at Zwartkops on the 25th June, 1915, it was mutually agreed that the river should remain closed to netting for a period of twelve months, during which regular experimental netting should be carried out. Two days later the first netting took place, and was repeated monthly to July, 1916.

This, briefly, is the history of the question, and we may now proceed to state the various difficulties on which the whole dispute is based. There is a great diversity of opinion on these points, and it was in the hope that light would be thrown on them that the series of nettings now completed were undertaken. These questions are :

(1) Do fish spawn or breed in the river ? If so, do sea fish generally resort to the river for this purpose, or only certain kinds.

(2) It is stated that the fish resort to the upper reaches of the river, and that this region ought to be specially protected. It has been stated that six kinds of fish are definitely known to breed in these upper reaches.

(3) Are such breeding fish seriously disturbed by such netting operations ?

(4) Of what nature are the eggs of these fishes ? It is stated that, some at least, are attached to the river weeds which are hauled up in large quantities by the nets at times. Some—as, for instance, those of the Steenbras—are said to be of the size of a small marble, and liable to be destroyed by netting.

(5) Not only the eggs of fish but thousands of very small and immature fish of 2 or 3 inches in length are found in the river and are destroyed by netting.

(6) The question as to whether the fish stay in the river or pass out and in freely to and from the sea has given rise to much dispute, and has an important bearing on the possibility of depleting the river of fish by netting.

(7) It is stated that fish are known to have become scarce as a result of netting and to become more abundant as a result of suspension of netting operations. The contrary is

also stated, and even that they have become scarcer by over-fishing with hook and line.

(8) What is the effect of great floods of fresh water on the fish supply in the river.

(9) Are quantities of sharks and other "vermin" which feed on fish removed from the river by netting.

(10) Can fish, after being caught in the net, be set free into the river and survive?

These are the most important points which have been raised, and the following methods of procedure were adopted for their investigation. Nettings were to be carried out monthly, more particularly at certain "spruits"—*i.e.*, channels or backwaters of the river in the manner usually adopted by the netters. A stop net is set across the opening of the spruit into the main stream at high water (springtide), and at low water another net is brought from the head of the spruit down towards the first. This method is shown in fig. 1, which is reproduced from a photograph of the first netting. The corks of the stop net are seen in the foreground, and the second net is being dragged down towards it from the head of the spruit, seen in the distance. This would seem so be a very effective method of removing all fish in the spruit, though in the actual nettings many fish were able to escape both nets for one reason or another. The fish are then dragged up on to the bank of the river and in this first experimental netting were laid out on the bank and photographed so that incontestable proof may be put on record as to the nature of the catch. The catch is shown in fig. 2. The fish were then counted, their size taken, a few typical specimens being opened and the condition of the reproduction organs and contents of the stomach noted. Some nettings are carried out by simply dragging the net towards the end of the spruit and then landing the fish as shown in fig. 3, p. 66.

Another method of investigation was adopted in addition to those mentioned. A series of townnettings were carried out in the river by means of which any fish eggs which might be in the water would be secured. The method, as will be seen from the result, proved very useful.

As this dispute has now been going on for many years and no definite information procured as to the facts of the case, and as these experimental nettings, undertaken at some expense to the Administration, have been carried out with some care, it is desirable to put the facts ascertained on record in a permanent form available for present and future reference.

The supervision of the netting operations has been ably carried out by Mr. F. W. Fitzsimons, F.Z.S., Director of the Port Elizabeth Museum, often under trying circumstances. The measurement of fish, examination of stomach contents, etc., preserving of specimens, collecting of townnettings and

forwarding for examination as well as the amicable settlement of various differences of opinion which arose in the course of the operations have been amongst the duties which he has successfully undertaken.

Much assistance has been rendered by the co-operation of the anglers, though the netting operations were naturally somewhat distasteful to them. The netters faithfully performed their part of the programme agreed upon.

Thanks are due to Mr. Arthur Green, photographer, Port Elizabeth, who generously took a number of photographs.

The plan of the Zwartkops River accompanying this report, and which shows the various "spruits" in which netting is usually carried out, is reproduced from one drawn up by Mr. W. S. Stead from original observations which he made in connection with this enquiry. He adds the following explanatory remarks:—"The area at the mouth of the river is a banking of sand, which extends to as far as the mouth of the Bristol Channel; from this point upwards, including the river islands, there is marshy land with river grass. Bordering on the south of Modder Spruit there is also marshy land with river grass. From the Bridge to Riverside there is mainly land covered, like the islands, by water at high tide. From Riverside to Red House the river is banked to a height of 6 feet by river deposit. From Red House to Perseverance the banks are from 6 feet to 10 feet high. Hills about 300 feet high—a cretaceous deposit—touch the river at Tipper's Creek, Riverside and Picnic Bend, and from there extend to Uitenhage."

#### DETAILS OF EXPERIMENTAL NETTINGS.

The nettings are numbered consecutively, the date and locality of each being given. The number and kinds of fish follow, with the length in inches, and weight. Remarks, when necessary, are added as to stomach contents and maturity of the fish.

No. 1.—Modder Spruit, 27th June, 1915.

No.	Kind.	Length.	Weight.	Remarks.
1	Springer	24 in.	5 $\frac{1}{3}$ lbs.	Ovaries fairly well developed.
269	"	23-11 in.	—	—
12	Mullet	12 $\frac{1}{2}$ -10 in.	—	—
1	Steenbras	44 in.	34 lbs.	Well-developed roe of 16 oz.
14	"	33-26 in.	—	Not spawning.
108	"	21-12 in.	—	Average size 16 in., not mature.
9	Kabeljauw	—	—	—
1	Elft	—	—	—
6	Leerfish	—	—	—
1	Porcupine Fish	—	—	—

## No. 2.—Tipper's Spruit, 25th July, 1915.

No.	Kind.	Length.	Weight.	Remarks.
97	Stumpnose	6-10 in. . .	—	—
1	Springer	21 $\frac{3}{4}$ -5 in. . .	4 lbs. . .	Male, testes undeveloped.
1	"	22 $\frac{1}{2}$ -5 in. . .	4 $\frac{1}{2}$ lbs. . .	Female, ova undeveloped.
3	"	—	—	Males, testes undeveloped.
2	"	—	—	Females, ova undeveloped.
1	"	12-2 $\frac{3}{4}$ in. . .	10 ozs. . .	—
530	Mullet	12-18 in. . .	—	—
20	Mullet	12 in. . .	—	—
1	Steenbras	34-9 in. . .	15 lbs. . .	Contents of stomach, Prawns.
1	"	34-9 in. . .	13 $\frac{1}{2}$ lbs. . .	" "
1	"	32-8 in. . .	13 $\frac{1}{2}$ lbs. . .	" "
1	"	18-5 in. . .	2 $\frac{1}{2}$ lbs. . .	" "
50	"	12-8 in. . .	—	—
1	Kabeljauw	30-6 in. . .	9 lbs. . .	Contents of stomach, Prawns and Shrimps.
1	"	18-4 $\frac{1}{4}$ in. . .	2 lbs. . .	—
12	"	—	1 $\frac{1}{2}$ -1 lbs. . .	—
3	Elft	6 in. . .	—	—
3	Leerfish	—	—	—
1	Electric Fish	—	4 lbs. . .	—

## No. 3.—Kob Spruit, 25th July, 1915.

29	Springers	12 in. . .	—	—
1	Steenbras	.. .	5 lbs. . .	—

## No. 4.—Modder Spruit, 22nd August, 1915.

91	Stumpnose	7-4 in. . .	—	—
300	"	11-8 in. . .	—	—
1	Springer	20-4 in. . .	4 $\frac{1}{2}$ ozs. . .	Male, testes undeveloped.
2	"	18-4 in. . .	—	Ova undeveloped.
336	"	—	—	No ova.
1	Mullet, Blue tail	21 in. . .	3 lbs. . .	Male, testes undeveloped.
168	Mullet	15-11 $\frac{1}{2}$ in.	Smallest 15 ozs.	—
1	Steenbras	30 in. . .	15 lbs. . .	Contents of stomach, Prawns and Worms; no ova.
12	"	21-10 in. . .	12 $\frac{1}{2}$ lbs.-8 oz.	"
1	Kabeljauw	25 in. . .	6 lbs. 14 ozs.	Contents of stomach, Shrimps; no ova.
6	"	20-11 in. . .	6 lbs.-11 oz.	Contents of stomach, Shrimps.
3	Tigerfish	18 in. . .	2 lbs. 14 ozs.	Contents of stomach, Prawns and worms; no ova.
5	"	16-13 in. . .	2 lbs. to 1 lb. 2 $\frac{1}{2}$ oz.	" "
1	Elft	18 in. . .	3 lbs. 2 ozs.	Contents of stomach, small Springers and Mullets; no ova.
51	"	15-11 in. . .	Smallest, 11 oz.	—
4	Leerfish	11 in. . .	1 $\frac{1}{4}$ lbs. . .	—
2	"	11 in. . .	12 ozs. . .	—
1	Electric Fish	—	—	—

(About 300 Stumpies and a few Steenbras cast back into the river alive, all averaging from 7-4 in.)

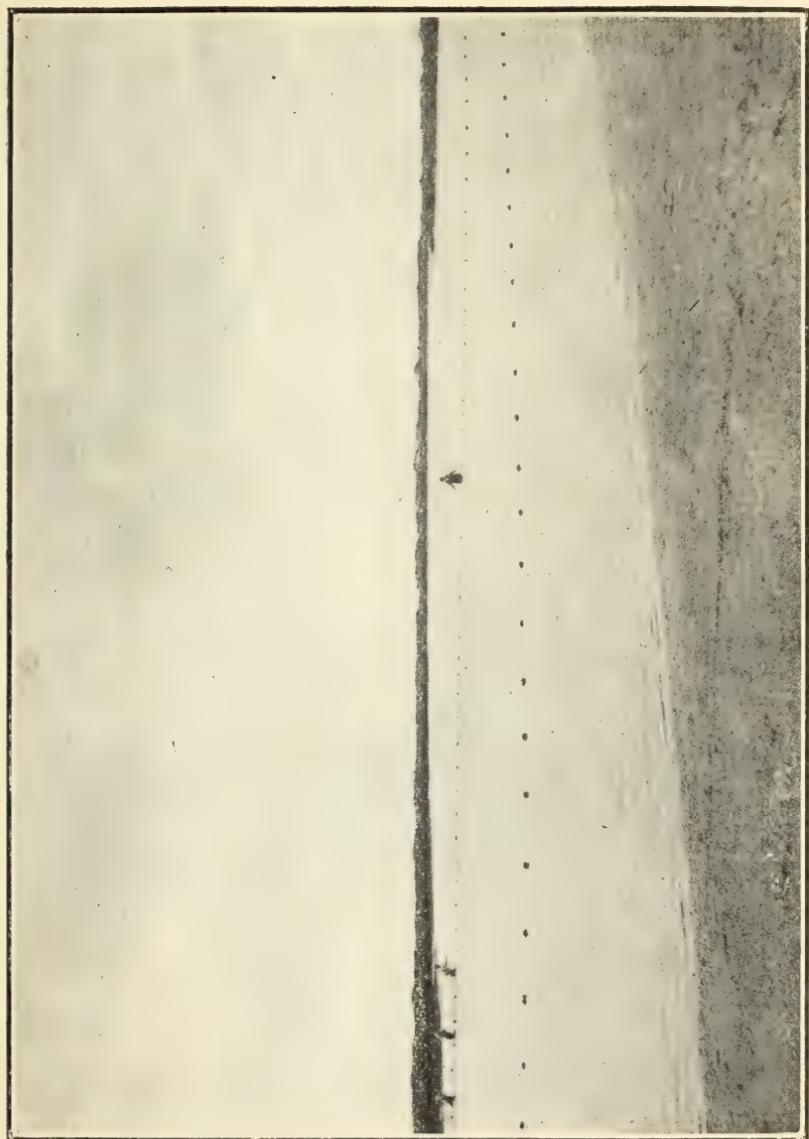


FIG 1.—Netting No. 1 at Modder Spruit, showing the usual method employed in the Zwartkops River.



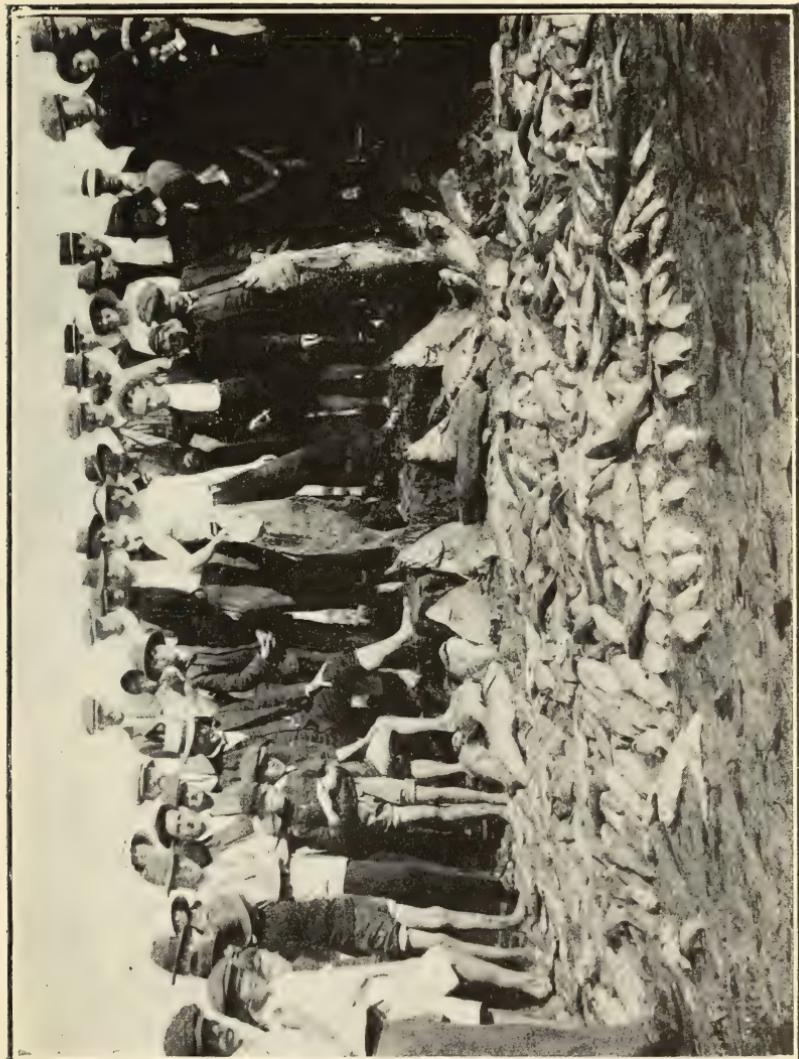


FIG. 2.—Results of Netting No. 1 at Modder Spruit, comprising 123 Steenbras (one, shown in the centre, weighing 34 lbs.), 270 Springers, etc. ; in all 413 fish.



## No. 5.—Wreck Spruit, 22nd August, 1915.

No.	Kind.	Length.	Weight.	Remarks.
I	Stumpnose ..	12 in. ..	1½ lbs. ..	No ova.
II	" ..	11 in. ..	1 lb. ..	—
19	" ..	10-9 in. ..	—	—
2	Springers ..	19 in. ..	4 lbs. ..	Ova undeveloped.
93	" ..	16-11 in. ..	3½ lb.-14 oz.	—
46	Mullet ..	16-11 in. ..	3½ lb.-14 oz.	No ova in the larger fish.
100	Steenbras ..	7-4 in. ..	—	—
I	Kabeljauw ..	35 in. ..	12 lbs. ..	Contents of stomach, Prawns and Shrimps; no ova in the females; testes in males undeveloped.
I	" ..	30 in. ..	9½ lbs. ..	" " "
I	" ..	23 in. ..	4½ lbs. ..	" " "
8	" ..	14-15 in. ..	—	—
I	Tigerfish ..	18 in. ..	3 lbs. ..	Contents of stomach, Prawns and blood worms; no ova in the females; male, testes undeveloped.
I	" ..	16½ in. ..	2 lbs. 11 oz.	" " "
42	" ..	15-11 in. ..	10 oz. smallest	" " "
100	" ..	7-4 in. ..	—	—
I	Elft ..	16 in. ..	1 lb. 15 oz.	Contents of stomach, Springers bitten in half, some of them whole; no ova.
II	" ..	14-10 in. ..	1½ lb.-9 oz.	With "young" almost fully developed.
I	Sand Shark ..	—	—	—

## No. 6.—Modder Spruit, 19th September, 1915.

309	Stumpnose ..	12-8 in. ..	1½ lb.-7¾ oz.	Contents of stomach, Prawns and vegetable matter.
29	Springers ..	17-11½ in.	2 lb.-10 oz.	Nothing in stomach; no ova in large specimens developed.
21	Mullet ..	14½-11 in.	1 lb.-8 oz.	Nothing in stomach; no ova.
I	Steenbras ..	33 in. ..	16½ lbs. ..	Prawns in stomach, male.
I	" ..	40 in. ..	29 lbs. ..	Prawns in stomach; ova undeveloped.
2	Kabeljauw ..	28 in. ..	8 lbs. ..	Prawns and Mullet; no ova.
41	" ..	20-12½ in.	6½ lb.-1 lb.	—
28	Tigerfish ..	20-12 in. ..	2½-1½ lbs.	Prawns in stomach; no ova.
4	Elft ..	10 in. ..	1-¾ lb. ..	Small Mullet and Prawns in stomach; no ova.
I	Gurnard ..	22 in. ..	—	—
I	Electric Fish ..	—	—	—

## No. 7.—Wreck Spruit, 19th September, 1915.

No.	Kind.	Length.	Weight.	Remarks.
321	Stumpnose	11-8 in. . .	1½ lbs.-7½ oz.	Prawns and weed in stomach ; no ova.
310	"	—	—	Cast back alive into the river.
2	Springer	19 in. . .	3½ lbs. . .	Ova undeveloped.
2	"	17 in. . .	2½ lbs. . .	"
469	"	16-11½ in.	2½ lb.-9 oz.	"
1	Mullet	14 in. . .	3 lbs. . .	"
231	"	14-10 in. . .	3 lb.-14 oz.	"
1	Steenbras	38 in. . .	22½ lbs. . .	Prawns in stomach ; ova undeveloped.
1	"	33 in. . .	14 lbs. . .	"
8	"	15-9 in. . .	7 lb.-8 oz.	Prawns in stomach ; no ova.
11	"	—	—	Cast back alive into the river.
1	Tigerfish	16½ in. . .	21 lb. 2 oz.	Prawns in stomach ; no ova.
2	"	16 in. . .	2 lbs. . .	"
1	"	12½ in. . .	1½ lbs. . .	"
60	"	12-11½ in.	1½ lb.-10 oz.	"
5	"	—	—	Cast back alive into the river.
1	Elft	16 in. . .	2 lbs. . .	Young Mullet and Springer in the stomach ; ova undeveloped.
13	"	13½-11 in.	1½ lb.-11 oz.	Young Mullet in the stomachs ; ova undeveloped.
2	Electric Fish	—	—	—

(The stomachs of all the Steenbras examined were full of Prawns. This was at 7 a.m., showing they are night feeders. All the fish caught were fat.)

## No. 8.—Perseverance, just below the drift, 4th October, 1915.

5	Stumpnose	9-6 in. . .	8-7 oz. . .	Vegetable matter and water fleas in their stomachs.
2	Springers	23 in. . .	4 lb.-8 oz.	Nothing in the stomachs.
1	"	21½ in. . .	4 lb. 1 oz.	" "
353	"	13-11 in. . .	1-¾ lb. . .	" "
398	Mullet	15-10½ in.	3 lb.-10½ oz.	Average length, 12 in. ; ova undeveloped.
102	Steenbras	26-12½ in.	10-1½ lb. . .	Prawns and Shrimps in the stomachs.
17	Kabeljauw	22-11 in. . .	4 lb.-8 oz.	"
491	Baggers	17-16 in. . .	2½-2 lbs.	The mouths of all were full of ripe eggs, an average number of from 30 to 36 eggs being in each. Many fish had eggs in their stomachs which were probably swallowed after the fish had been taken from the water. The eggs were bright yellow, and the size of a pea.
1	Tigerfish	10 in. . .	¾ lb. . .	Nothing in the stomach.
7	Elft	13-10 in. . .	1-½ lb. . .	Small Stumpnose in the stomachs.
12	Leerfish	15-10 in. . .	1½ lb.-6 oz.	Small Mullet and Springers in the stomachs. One of 10 in. had a Mullet of 7 in. in its stomach.
6	Moonfish	3½-3 in. . .	2-1¾ oz. . .	Nothing in the stomachs.

(Nets were set at 1 a.m. and drawn at 8 a.m.)

## No. 9.—Wreck and Harry Spruits, 24th October, 1915.

No.	Kind.	Length.	Weight.	Remarks.
390	Stumpnose	12-6 in. . .	—	Vegetable matter, worms, Prawns and small shellfish in the stomachs.
I	"	12 in. . .	1 $\frac{1}{4}$ lbs. . .	" "
I	"	7 in. . .	1 $\frac{1}{2}$ lbs. . .	" "
135	Springers	16 $\frac{1}{2}$ -12 in. . .	2 $\frac{3}{4}$ lb. . .	Vegetable matter in stomachs.
I	Mullet	24 in. . .	4 $\frac{1}{2}$ lbs. . .	—
43	"	20-12 $\frac{1}{2}$ in. . .	3 $\frac{1}{2}$ - $\frac{3}{4}$ lb. . .	Vegetable matter in stomachs.
I	Steenbras	40 in. . .	25 $\frac{1}{2}$ lbs. . .	Prawns in the stomach.
I	"	39 in. . .	25 lbs. . .	Wire worms in the stomach.
I	"	39 in. . .	25 lbs. . .	Prawns in the stomach.
I	"	38 in. . .	22 $\frac{1}{2}$ lbs. . .	" "
I	"	37 $\frac{1}{2}$ in. . .	22 lbs. . .	" "
I	"	37 in. . .	22 $\frac{1}{2}$ lbs. . .	" "
I	"	34 $\frac{1}{2}$ in. . .	15 lbs. . .	" "
I	"	34 in. . .	17 lbs. . .	" "
I	"	33 $\frac{3}{4}$ in. . .	16 $\frac{1}{2}$ lbs. . .	" "
I	"	24 in. . .	6 $\frac{1}{2}$ lbs. . .	" "
I	"	23 $\frac{1}{2}$ in. . .	6 lbs. . .	" "
65	"	23-9 in. . .	6- $\frac{1}{2}$ lbs. . .	The roes of several of the larger fish examined did not contain ova.
I	Kabeljauw	39 in. . .	15 lbs. . .	Prawns and shellfish in the stomach; no ova.
I	"	26 in. . .	6 $\frac{1}{2}$ lbs. . .	Small Mullet in the stomach.
2	"	24 in. . .	4 $\frac{1}{2}$ lbs. . .	Nothing in the stomach.
2	"	19 in. . .	3 lbs. . .	Prawns in the stomach.
4	"	17-10 $\frac{1}{2}$ in. . .	—	Worms and Prawns in the stomach.
45	Tigerfish	16-7 $\frac{1}{2}$ in.; . .	—	—
I	"	16 in. . .	2 lbs. . .	—
I	"	11 in. . .	1 lb. . .	—
2	Elft	" . .	2 lbs. . .	Remains of young Mullet in the stomachs.
I	"	11 in. . .	1 $\frac{1}{2}$ lb. . .	Nothing in the stomach.
22	"	18-11 in. . .	—	—
I	Sand Shark	38 in. . .	7 lbs. . .	Prawns in the stomach.
I	Gurnard	25 in. . .	5 lbs. . .	Ova undeveloped.

## No. 10.—Modder Spruit, 24th October, 1915.

735	Stumpnose	11 $\frac{1}{2}$ -7 in. . .	1- $\frac{1}{4}$ lb. . .	Remains of Periwinkles in the stomachs of some.
I	Springer	28 $\frac{1}{2}$ in. . .	7 lbs. . .	—
293	"	22 $\frac{1}{4}$ -11 in. . .	5- $\frac{3}{4}$ lbs. . .	Vegetable matter in stomachs of some.
39	Mullet	22-11 in. . .	4- $\frac{3}{4}$ lbs. . .	—
I	Steenbras	36 $\frac{1}{2}$ in. . .	21 lbs. . .	Prawns in stomach; fno ova.
I	"	36 $\frac{1}{2}$ in. . .	23 lbs. . .	" "
I	"	37 $\frac{1}{2}$ in. . .	22 lbs. . .	" "
I	"	28 in. . .	10 lbs. . .	" "
80	"	20-9 in. . .	3- $\frac{1}{2}$ lb. . .	" "
I5	Kabeljauw	32-12 $\frac{1}{2}$ in. . .	10-1 lbs. . .	Prawns and Mullets in the stomachs of some.
9	Tigerfish	19 $\frac{1}{2}$ -14 $\frac{1}{2}$ in. . .	3-1 $\frac{3}{4}$ lbs. . .	Prawns and worms in the stomachs.
34	Elft	19 $\frac{1}{4}$ -11 $\frac{1}{2}$ in. . .	2 $\frac{1}{2}$ -1 lbs. . .	Mullets in stomachs of some; ova very small.
I	Leerfish	14 in. . .	1 lb. . .	Young Mullets and Shrimps in the stomachs.
I	"	13 in. . .	1 $\frac{1}{2}$ lb. . .	" "

## No. 11.—Modder Spruit, 20th November, 1915.

No.	Kind.	Length.	Weight.	Remarks.
259	Stumpnose	12 $\frac{1}{2}$ -8 in...	2 lb.-7 oz.	Worms, Prawns and Shellfish in the stomachs.
367	Springers	16 $\frac{1}{2}$ -10 in.	2 lb.-7 oz.	" Grass and grit in stomachs.
15	Mullet,	19-12 in...	2 $\frac{1}{4}$ lb.-12 oz.	Grass, grit and mud in the stomachs of some; no ova. Prawns in stomach, roe empty.
I	Steenbras	41 in.	31 lbs. . .	" "
I	"	39 in.	24 lbs. . .	" "
I	"	37 in.	22 lbs. . .	" "
I	"	36 $\frac{1}{2}$ in.	20 $\frac{1}{2}$ lbs. . .	" "
I	"	35 in.	19 lbs. . .	Prawns in stomach, testes sp.
I	"	38 in.	22 $\frac{1}{2}$ lbs. . .	Prawns in stomach, roe empty.
I	"	36 in.	21 lbs. . .	" "
I	"	33 in.	15 lbs. . .	" "
I	"	30 in.	16 lbs. . .	" "
I	"	31 $\frac{1}{2}$ in.	22 $\frac{1}{2}$ lbs. . .	" "
I	"	25 in.	9 lbs. . .	" "
I	"	20 in.	6 lbs. . .	Male, Prawns in the stomach.
39	"	18 $\frac{1}{2}$ -8 in...	3 $\frac{1}{2}$ lb.-6 oz.	Shrimps in stomach; no ova.
I	Kabeljauw	29 in.	9 $\frac{1}{2}$ lbs. . .	Male, with parasitic worms in the stomach, also Mullet.
I	"	26 in.	7 lbs. . .	Shrimps and worms in the stomach; no ova.
19	"	21-12 in...	6 $\frac{1}{4}$ lb.-15 oz.	Shrimps, Mullets and grass in the stomachs.
5	Baggers	16 in.	2 lbs. . .	Prawns in stomach; no ova.
12	Tigerfish	16-10 in...	2 $\frac{1}{4}$ - $\frac{1}{2}$ lbs. . .	Shrimps in stomach; no ova.
37	Elft	17-9 in...	1 $\frac{3}{4}$ - $\frac{3}{4}$ lbs. . .	Shrimps and small Mullet in the stomachs.
4	Leerfish	12 in.	3 $\frac{3}{4}$ lb. . .	Nothing in the stomachs.
I	Black-tailed Dassie.	14 in.	2 lbs. . .	—
I	Gurnard	23 in.	4 $\frac{3}{4}$ lbs. . .	Nothing in the stomach.

## No. 12.—Wreck Spruit, 20th November, 1915.

40	Springers	15-11 in...	2-1 lbs. . .	—
12	Mullet	18-11 in...	2 $\frac{1}{2}$ -1 lbs. . .	—
28	Steenbras	12-8 $\frac{1}{2}$ in...	1 $\frac{1}{2}$ - $\frac{1}{2}$ lbs. . .	—
3	Kabeljauw	31-13 in...	12-1 lbs. . .	Mullet in the stomachs.
4	Tigerfish	16 $\frac{1}{2}$ -11 $\frac{1}{2}$ in.	2-1 lbs. . .	—
14	Elft	16-10 in...	2 lb.-8 oz.	—

## No. 13.—Modder Spruit, 19th December, 1915.

84	Stumpnose	..	10 $\frac{1}{2}$ —7 in. . .	1 lb.—5 oz.	Prawns in the stomach, no ova.
100	Springers	..	17—10 in. . .	2— $\frac{1}{2}$ lb. . .	Small animals in stomach; no ova.
19	Mullets	..	14 $\frac{1}{2}$ —10 $\frac{3}{4}$ in.	1— $\frac{1}{2}$ lb. . .	"
1	Steenbras	..	38 in. . .	24 $\frac{1}{2}$ lbs. . .	Prawns in stomach, roe empty.
1	"	..	38 in. . .	24 lbs. . .	"
1	"	..	37 in. . .	21 lbs. . .	Nothing in the stomach, roe empty.
1	"	..	37 in. . .	21 $\frac{1}{2}$ lbs. . .	Prawns and shellfish in the stomach.
1	"	..	34 $\frac{1}{2}$ in. . .	17 lbs. . .	"
1	"	..	34 in. . .	16 $\frac{1}{2}$ lbs. . .	Nothing in the stomach.
10	"	..	16—9 in. . .	3 lbs.—8 oz.	—
19	Kabeljauw	..	23—11 $\frac{1}{2}$ in.	4 $\frac{3}{4}$ — $\frac{1}{2}$ lbs. . .	Rock Cod in the stomach.
20	Baggers	..	16—16 in. . .	2 lbs. . .	Prawns in the stomach.
6	Tigerfish	..	13—12 in. . .	1 $\frac{1}{4}$ —1 lb. . .	Prawns in stomachs of three.
18	Elft	..	14—12 in. . .	1— $\frac{1}{2}$ lb. . .	Mullet, Shrimps and Rock Cod in the stomachs.
3	Leerfish	..	18 $\frac{1}{2}$ —15 in.	2 $\frac{1}{4}$ —1 lbs. . .	Nothing in the stomachs.

(Five Sea Snails, 2 Octopi and 2 Cuttlefish were also found in the netting.)

## No. 14.—Wreck Spruit, 19th December, 1915.

94	Stumpnose	..	10—7 in. . .	1 lb.—5 oz.	Prawns in stomach of some.
119	Springers	..	17 $\frac{1}{2}$ —11 $\frac{1}{2}$ in.	2 $\frac{1}{2}$ — $\frac{1}{2}$ lbs. . .	—
52	Mullets	..	25—10 $\frac{1}{2}$ in.	4— $\frac{1}{2}$ lbs. . .	—
15	Steenbras	..	14—9 $\frac{1}{2}$ in. . .	1 $\frac{1}{2}$ — $\frac{1}{2}$ lbs. . .	Prawns in the stomachs.
4	Kabeljauw	..	29 $\frac{1}{2}$ —14 $\frac{1}{2}$ in.	8 $\frac{1}{2}$ —1 $\frac{1}{4}$ lbs.	Prawns and young Mullet in stomachs.
1	Bagger	..	17 in. . .	1 $\frac{3}{4}$ lbs. . .	Nothing in the stomach.
9	Tigerfish	..	17 $\frac{1}{2}$ —11 in.	2 $\frac{1}{2}$ —1 lbs. . .	Shrimps and Crab in the stomachs.
2	Elft	..	12 $\frac{1}{2}$ in. . .	1 lb. . .	Nothing in the stomachs.

(The tide was a poor one. Netters attribute the small catch to this.)

## No. 15.—Perseverance, 21st December, 1915.

No.	Kind.	Length.	Weight.	Remarks.
89	Stumpnose	..	11—4 $\frac{1}{2}$ in. . .	1 lb.—3 oz.
179	Springers	..	16 $\frac{1}{2}$ —12 in.	2— $\frac{1}{2}$ lbs. . .
21	Mullets	..	22—11 in. . .	3 $\frac{3}{4}$ — $\frac{1}{2}$ lbs. . .
9	"	..	7 in. . .	—
78	Steenbras	..	15—8 in. . .	1 $\frac{1}{2}$ — $\frac{1}{4}$ lbs. . .
7	Kabeljauw	..	32—13 in. . .	6— $\frac{1}{2}$ lbs. . .
4	Baggers	..	16 in. . .	2 lbs. . .
2	Tigerfish	..	10 $\frac{1}{2}$ —8 $\frac{1}{2}$ in.	$\frac{1}{2}$ lb.—6 oz.
10	Elft	..	16—9 in. . .	1— $\frac{1}{2}$ lbs. . .
29	Leerfish	..	19—13 in. . .	1 $\frac{1}{2}$ —1 lbs. . .
6	Moonfish	..	6—4 $\frac{1}{2}$ in. . .	4—2 oz. . .
1	Dassie	..	6 in. . .	—
1	"	..	9 in. . .	—

(A large bunch of Cuttlefish eggs, about 1,500 in number, were got in this netting along with four Cuttlefish.)

## No. 16.—Modder Spruit, 23rd January, 1916.

No.	Kind.	Length.	Weight.	Remarks.
420	Stumpnose	11-6½ in.	1 lb.-5 oz.	—
I	Springer	18 in.	2½ lbs.	No ova.
6	"	17-15 in.	2½-1¾ lbs.	"
9	"	14-11 in.	1½-¾ lbs.	—
I	Mullet	21½ in.	3 lbs.	—
3	"	20 in.	2¾ lbs.	—
2	"	19 in.	2½ lbs.	—
6	"	18-10½ in.	2½-1 lbs.	—
I	Steenbras	39 in.	25 lbs.	Prawns in stomach; ova undeveloped.
I	"	38½ in.	26 lbs.	"
I	"	38 in.	23 lbs.	"
I	"	38 in.	—	Released after attaching a balloon to its tail.
I	"	37 in.	28 lbs.	Prawns in stomach; ova undeveloped.
I	"	19 in.	2½ lbs.	—
12	"	15½-13 in.	2-1½ lbs.	Prawns in the stomachs.
10	"	12 in.	1½ lbs.	—
50	"	11-9 in.	1-½ lb.	—
I	Kabeljauw	39 in.	20 lbs.	Mullet and grass in the stomach; no eggs in ovaries.
I	"	34 in.	15 lbs.	—
I	"	30 in.	11 lbs.	Mullet only in stomach.
2	"	28 in.	9½ lbs.	—
I	"	27½ in.	9 lbs.	—
I	"	27 in.	9 lbs.	—
I	"	25 in.	8½ lbs.	—
I	"	22 in.	5 lbs.	—
6	"	16-15 in.	2½-1½ lbs.	—
17	"	14-8 in.	1½-1 lb.	—
2	Baggers	16 in.	2 lbs.	—
I	Tigerfish	17 in.	2½ lbs.	—
3	"	16-13 in.	2-1¾ lbs.	—
I	"	11 in.	1½ lbs.	—
I	Elft"	19 in.	2½ lbs.	Mullet in stomach; no ova.
14	"	13-14 in.	1 lb.	No ova.
9	"	12-10 in.	—	—
I	Leerfish	18½ in.	2 lbs.	—
I	"	15½ in.	1 lb.	—
I	Sting Ray	—	26 lbs.	Prawns in the stomach.

## No. 17.—Wreck Spruit, 23rd January, 1918.

No.	Kind.	Length.	Weight.	Remarks.
224	Stumpnose	11 $\frac{1}{2}$ –5 in...	1 lb.–3 $\frac{1}{2}$ oz.	Worms and Prawns in stomachs.
5	Springers	17–16 in...	2 $\frac{3}{4}$ –2 $\frac{1}{2}$ lbs.	Small animals and sea grass in the stomachs; ovaries empty
60		16–12 in...	2 $\frac{1}{2}$ –3 lbs.	—
1	Mullet	23 in...	3 $\frac{1}{4}$ lbs.	” ”
8	”	22–20 in...	3 $\frac{3}{4}$ –3 $\frac{1}{2}$ lbs.	” ”
38	”	20–13 in...	3 $\frac{1}{4}$ –3 $\frac{3}{4}$ lbs.	—
2	Steenbras	18 in...	3 lbs.	Prawns and Shrimps in the stomachs; ova undeveloped.
1	”	17 in...	2 $\frac{1}{2}$ lbs.	” ”
12	”	16–15 in...	2 $\frac{1}{4}$ –2 lbs.	Prawns and Shrimps in stomachs.
30		14–9 in...	2– $\frac{1}{2}$ lbs.	—
1	Kabeljauw	30 in...	9 $\frac{1}{2}$ lbs.	Prawns in stomach.
1	”	11 in...	2 $\frac{1}{2}$ lb.	—
1	”	7 $\frac{1}{2}$ in...	4 lb.	—
2	Tigerfish	16 $\frac{1}{2}$ –16 in...	2 lbs.	Prawns in the stomachs.
5	”	14–13 in...	1 $\frac{3}{4}$ lbs.	” ”
5	”	12–11 in...	1 $\frac{1}{2}$ –1 $\frac{1}{4}$ lbs.	—
2	Elft	17 in...	2 lbs.	Needle fish and Mullet in the stomachs; no ova.
2	”	16 in...	1 $\frac{3}{4}$ lbs.	Mullet in the stomachs.
10	”	14–9 in...	1– $\frac{1}{2}$ lb.	Small Mullet in the stomachs of some.
2	Leerfish	16 in...	1 $\frac{1}{4}$ lbs.	Mullet in the stomachs.
1	Dasje (Black-tail).	12 in...	1 $\frac{1}{4}$ lbs.	Shrimps, and Prawns in the stomach; no ova.
15	”	9–6 $\frac{1}{2}$ in...	1– $\frac{1}{4}$ lb.	” ”

## No. 18.—Wreck Spruit, 20th February, 1916.

1	Stumpnose	14 in...	2 lbs.	—
156	”	9–12 in...	1 $\frac{3}{4}$ –2 $\frac{1}{2}$ lbs.	—
1	Springer	17 in...	2 lbs.	Stomach empty; no roe.
25	”	14–12 in...	1 $\frac{1}{2}$ –1 lbs.	—
2	Mullet	23 in...	4 lbs.	Nothing in the stomach; roe empty.
1	”	22 in...	4 lbs.	” ” ”
18	”	16–12 $\frac{1}{2}$ in...	2 $\frac{1}{2}$ –1 lbs.	—
1	Steenbras	18 $\frac{1}{2}$ in...	3 lbs.	Few Prawns in the stomach roe undeveloped.
5	”	15 in...	1 $\frac{1}{2}$ lbs.	Contents of stomach, fish.
20	”	9–12 in...	1– $\frac{1}{2}$ lbs.	” ” ”
1	Kabeljauw	32 in...	11 $\frac{1}{2}$ lbs.	” ” ”
1	”	15 in...	1 $\frac{1}{2}$ lbs.	Contents of stomach, nil; roe undeveloped.
1	Tigerfish	16 in...	2 lbs.	” ” ”
14	Elft	15–12 in...	2–1 $\frac{1}{4}$ lbs.	Nothing in the stomach; roe undeveloped.
1	”	19 in...	2 $\frac{3}{4}$ lbs.	—
3	”	15–13 in...	1 $\frac{1}{4}$ –1 lbs.	—
1	Leerfish	9 in...	—	—
1	”	7 in...	—	—

## No. 19.—Modder Spruit, 20th February, 1916.

No.	Kind.	Length.	Weight.	Remarks.
226	Stumpnose	9-8 in.	—	—
27	Springers	19-18 in.	2 lbs.	Nothing in the stomachs.
19	"	13 in.	—	—
26	"	11-10 in.	—	—
1	Mullet	16½ in.	—	—
1	"	16 in.	—	—
2	"	12 in.	—	—
1	Steenbras	13 in.	1 lb.	Nothing in the stomach.
21	"	11-10½ in.	¾ lb.	—
1	Kabeljauw	49 in.	32 lbs.	Nothing in the stomach ; mature male.
1	"	25 in.	6 lbs.	—
1	"	23 in.	4½ lbs.	—
1	"	18 in.	2½ lbs.	—
15	"	14-12 in.	—	—
1	Bagger	15 in.	1½ lbs.	—
2	Tigerfish	10½ in.	¾ lb.	—
1	Elft	21 in.	3 lbs.	Nothing in the stomach.
27	"	17-14 in.	—	—
7	Leerfish	11-8½ in.	—	—
1	Electric Fish	—	15 lbs.	Nothing in the stomach ; full of immature young.

(At half tide, owing to a large accumulation of sea-grass, the net broke away from its moorings on both banks, and had to be reset.)

## No. 20.—Telegraph Spruit (fig. 3) and Tipper's Creek, 7th March, 1916.

236	Stumpnose	13-10 in.	—	—
2800	"	9-7 in.	—	—
57	Springers	20-17 in.	2½-2 lbs.	Roe empty.
269	"	17-14 in.	1½ lbs.	—
265	"	12-11 in.	¾ lb.	—
22	Mullet	15-13 in.	1½-1 lbs.	—
1	Steenbras	40 in.	30 lbs.	Prawns in the stomach ; roe empty.
1	"	39 in.	22 lbs.	Prawns in the stomach ; roe empty and diseased.
1	"	35 in.	15 lbs.	Prawns and grass in stomach.
15	"	21-17 in.	4½-2½ lbs.	—
23	"	15 in.	2 lbs.	—
37	"	12 in.	1 lb.	—
1	Kabeljauw	59 in.	70 lbs.	Contents of stomach, fish and grass ; ova with undeveloped eggs.
1	"	56 in.	65 lbs.	Contents of stomach, Cuttle fish and Mullet ; ova with undeveloped eggs.
1	"	32 in.	11 lbs.	—
1	"	27 in.	7½ lbs.	—
2	"	25 in.	6½ lbs.	—
1	"	25 in.	6 lbs.	—
3	"	20 in.	3 lbs.	—
5	"	19 in.	2½ lbs.	—
6	"	15 in.	1½ lbs.	—
18	"	14-11 in.	—	—
1	Bagger	13 in.	—	Young in the mouth.
1	Tigerfish	13 in.	1 lb.	—
1	Elft	10 in.	½ lb.	—
1	"	21 in.	3 lbs.	Stomach and roe empty.
38	"	15-12 in.	1-½ lb.	Fish in the stomachs of some.
7	Leerfish	12-8 in.	1-¼ lb.	—
9	Electric Fish	—	—	Large.
1	Dassie	15 in.	2½ lbs.	—
1	"	13 in.	1½ lbs.	—
1	"	9 in.	½ lb.	—
1	Skate	6 ft. across	—	—
3	Pijlstaart	—	—	Large.
10	Dassies, Striped	8 in.	—	—
1	Needlefish	—	—	—

(Twenty Cuttle fish and one Octopus were found in the netting.)

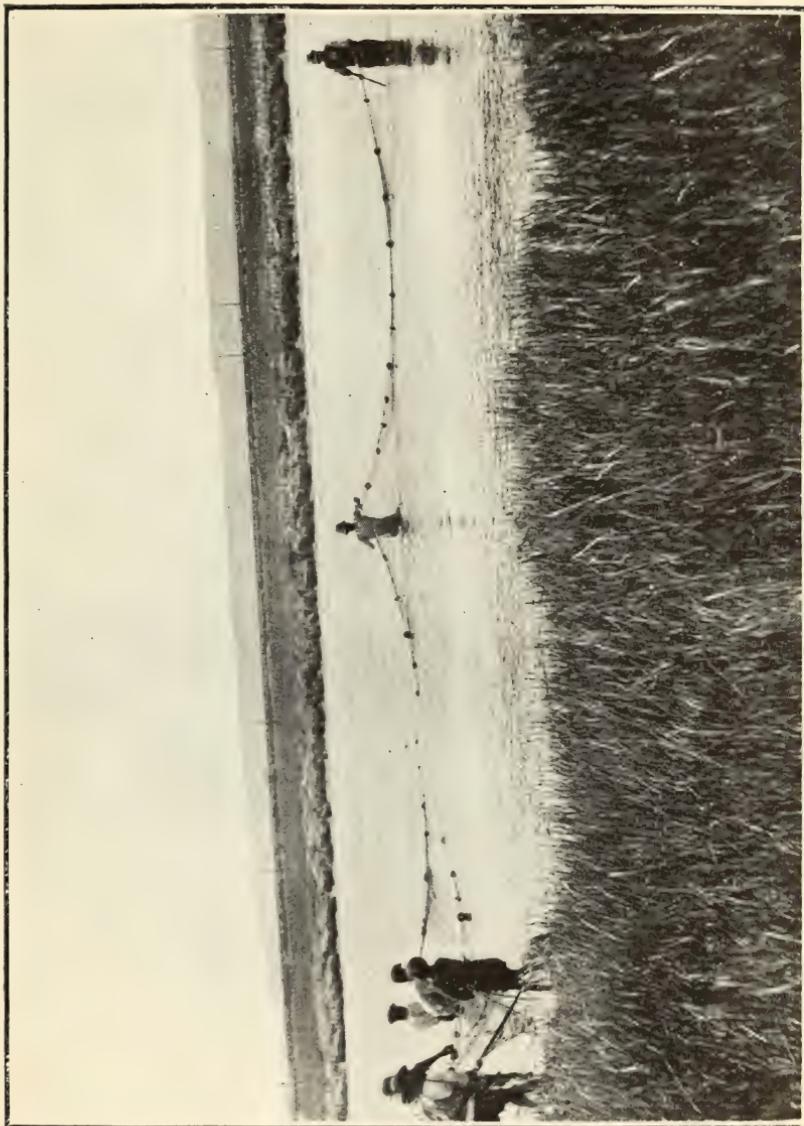


FIG. 3.—Netting No. 20 at Telegraaf Spruit, showing another method of netting in the Zwartkops River.



## No. 21.—Wreck Spruit, 19th March, 1916.

No.	Kind.	Length.	Weight.	Remarks.
1	Stumpnose	11½ in.	1½ lbs.	—
35	"	8 in.	—	No ova; Prawns in stomachs.
2	Springers	17½ in.	2½ lbs.	No ova.
1	"	17 in.	2 lbs.	"
8	"	14-11½ in.	—	—
1	Mullet	21 in.	3 lbs.	No ova.
1	"	20½ in.	3 lbs.	"
1	"	20 in.	3 lbs.	"
1	"	17 in.	1½ lbs.	—
6	"	16 in.	1½ lbs.	—
7	"	11½-11 in.	¾ lb.	—
8	Steenbras	13-9 in.	—	—
1	Tigerfish	13 in.	1½ lbs.	—
1	"	12 in.	1 lb.	—
1	Elft	12 in.	1 lb.	—
1	Leerfish	10 in.	—	—
1	Electric Fish	—	—	—

(One Cuttle fish found in the netting.)

## No. 22.—Modder Spruit, 19th March, 1916.

11	Stumpnose	11-10 in.	..	No ova; Prawns in stomach.
25	"	9-8 in.	—	—
2	Springers	16½ in.	2 lbs.	No ova.
7	"	11½ in.	—	"
1	Mullet	24 in.	4 lbs.	"
2	"	23 in.	3½ lbs.	"
3	"	22 in.	3 lbs.	"
10	"	18-12 in.	—	—
2	"	20 in.	2½ lbs.	No ova.
9	Steenbras	20-19 in.	4½-4½ lbs.	—
15	"	14-11 in.	—	—
2	Kabeljauw	31 in.	11 lbs.	No ova.
1	"	29½ in.	8 lbs.	"
1	"	23 in.	4 lbs.	"
1	"	14 in.	—	—
1	Bagger	17½ in.	2 lbs.	—
2	"	16 in.	2 lbs.	—
1	Tigerfish	14 in.	—	—
2	Elft	18½ in.	2½ lbs.	—
1	"	15½ in.	—	—
12	Leerfish	11½-9 in.	—	Fish in some stomachs.
7	Skate	30 in. in breadth.	—	Prawns in all stomachs, no other food. (Netters say these are vermin and destroy other fish.)

## No. 23.—Modder Spruit, 21st April, 1916.

No.	Kind.	Length.	Weight.	Remarks.
24	Stumpnose	10 in.	—	—
275	"	8-7 in.	—	—
1	Springer	16½ in.	1½ lbs.	—
12	"	15½-12 in.	—	—
1	Mullet	12 in.	—	—
1	Steenbras	17 in.	2½ lbs.	Prawns in the stomach.
1	"	13 in.	1¼ lbs.	—
10	"	10-8 in.	—	" — "
1	Kabeljauw	65 in.	70 lbs.	Prawns in the stomach; flesh and viscera full of tapeworm cysts.
1	"	35 in.	9 lbs.	Prawns in the stomach.
1	"	31 in.	8½ lbs.	—
1	"	26 in.	4½ lbs.	—
1	"	22 in.	4 lbs.	—
8	Baggers	16-15 in.	2 in.	Prawns and fish in stomach.
1	Elft	20 in.	3 lbs.	Fish in the stomach.
1	"	18 in.	2 lbs.	—
18	"	17-15 in.	—	" — "
25	Leerfish	14-8 in.	—	Mullet in some stomachs.

(A powerful south-east wind arose shortly after the nets were set and continued all day. Drift grass accumulated so rapidly on the nets that it was impossible to free them from it. The result was they burst, and the lead lines were raised from the bed of the spruit. However, the spruit was swept at low tide in the usual manner with the above result.)

## No. 24.—Wreck Spruit, 21st September, 1916.

36	Stumpnose	8 in.	—	—
15	Springers	15-9 in.	—	—
2	Mullet	20 in.	2½ lbs.	—
10	"	16-10 in.	—	—
1	Steenbras	13 in.	—	—
2	Kabeljauw	11 in.	—	—
1	Leerfish	11½ in.	—	—

## No. 25.—Perseverance, 2nd May, 1916.

60	Stumpnose	10-7 in.	—	—
1	Springer	23 in.	5 lbs.	Roe large and full of eggs.
1	"	20 in.	3½ lbs.	—
47	"	18-14 in.	—	—
115	"	13½-12 in.	—	—
59	Mullet	13-11 in.	—	Roe large and full of ova in some.
12	Steenbras	17-14 in.	—	Of six examined the stomachs of five were empty; the sixth contained a Blenny.
30	"	13-10½ in.	—	—
100	"	10-8 in.	—	—
1	Kabeljauw	34 in.	14 lbs.	—
1	"	33 in.	10 lbs.	—
1	"	23 in.	—	—
8	"	17-11 in.	—	—
1	Elft	20 in.	3 lbs.	—
6	"	16-11 in.	—	Mullet in some stomachs.
1	Leerfish	15 in.	—	—
14	"	14-12 in.	—	Mullet and Stumpnose in the stomachs of some.
16	Moonfish	5½ in.	—	—
4	Dassies, Striped	8-7 in.	—	—

## No. 26.—Wreck Spruit, 14th May, 1916.

No.	Kind.	Length.	Weight.	Remarks.
180	Stumpnose	11-17 in.	—	—
10	Springers	18-16 in.	—	—
27	"	14-13 in.	—	—
71	"	12-11 in.	—	—
1	Mullet (Blue)	24½ in.	4 lbs.	—
11	"	20-17 in.	—	—
14	"	15-13 in.	—	—
18	"	13-10 in.	—	—
10	Steenbras	14-9 in.	—	Prawns in stomachs of some.
1	Kabeljauw	20 in.	3 lbs.	Prawns and fish in the stomach.
14	Tigerfish	17-11 in.	1½ lbs.	Prawns in the stomachs.
5	Elft	15-9 in.	—	—
6	Leerfish	11-8 in.	—	—
1	Electric Fish	—	—	Contained eggs; stomach empty.

## No. 27.—Modder Spruit, 14th May, 1916.

177	Stumpnose	11-8 in.	—	—
1	Springer	23 in.	—	—
27	"	19-15 in.	—	—
26	"	14-13 in.	—	—
67	"	12-11 in.	—	—
1	Mullet (Blue-tail).	26 in.	5 lbs.	—
1	"	25 in.	4½ lbs.	—
24	"	17-14 in.	—	—
1	Steenbras	43 in.	35 lbs.	—
1	"	42½ in.	29¾ lbs.	—
1	"	40 in.	26½ lbs.	—
2	"	39 in.	24 lbs.	—
1	"	38 in.	22 lbs.	—
1	"	38 in.	21½ lbs.	—
2	"	37 in.	20½ lbs.	—
1	"	36 in.	17½ lbs.	—
1	"	34 in.	16 lbs.	—
1	"	29 in.	12 lbs.	—
10	"	20-13 in.	—	—
18	"	12-9 in.	—	Prawns in some stomachs; no eggs.
2	Kabeljauw	17-12 in.	—	—
1	Bagger	17 in.	—	Stomach full of Prawns.
10	Tigerfish	18-15 in.	—	—
6	"	14-10 in.	—	Prawns in the stomachs.
5	Elft	15-11 in.	—	—
11	Leerfish	15-9 in.	—	—
2	Cuttlefish	—	—	—

(The first sweep was performed in the usual manner, and resulted in two large Steenbras and comparatively few other fish. A second sweep made, the greatest care being taken to keep the lead lines low in at least some of the numerous holes in the bottom of the Spruit. The result was ten big Steenbras and a large catch of other fish. Some large Steenbras escaped.)

## SYNOPSIS OF EXPERIMENTAL NETTINGS IN ZWARTKOPS RIVER.

Date	Locality.	Total.
June 27, 1915	Modder Spruit.	427
July 25,	Tippers Spruit.	725
July 25,	Kob Hole Spruit.	30
August 22,	Wreck Spruit.	380
August 22,	Modder Spruit.	986
September 19,	Wreck Spruit.	1441
September 19,	Modder Spruit.	438
September 19,	Perseverance.	1395
October 4,	Wreck Spruit.	741
October 24,	Modder Spruit.	1212
October 24,	Modder Spruit.	774
November 20,	Wreck Spruit.	103
November 20,	Modder Spruit.	293
December 19,	Wreck Spruit.	296
December 21,	Perseverance.	436
Stumphouse.		
Springer.		
Mullet.		
Kabefauw.		
Sea Barbel.		
Tiger Fish.		
Eff.		
Leer Fish.		
Electric Fish.		
Moon Fish.		
Black-tailed Bassett.		
Striped Bassett.		
Ray.		
Sand Sharck.		
Gurnard.		
Porcupine Fish.		
State.		
Total.		

Though no ripe eggs were procured from fish, many eggs were procured by townnetting in the river, indicating that some kinds of fish do breed in the river. The following is a short account of townnettings, with date and contents of nets :

28th June, 1915.—Small crustacea and crustacean larvae, a few *Sagitta*, *Beroe* and *Noctiluca*. No fish eggs.

10th August, 1915.—Many *Sagitta*, a few small crustacea and much vegetable debris. No eggs.

27th August, 1915.—*Sagitta*, crustacean larvae, no eggs.

29th September, 1915.—Crustacean larvae and a few annelid larvae; no eggs.

10th October, 1915.—Much vegetable matter, small univalves, small crustacea and foraminifera, two fish eggs, .89 mm. in diameter with an oil globule .21 mm. in diameter, and therefore probably those of the Kabeljauw (*Sciaena aquila*).

26th October, 1915.—A little vegetable matter, one egg .66 mm. in diameter, with about 13 oil globules each .04 mm. in diameter with advanced embryo, and another egg .89 mm. in diameter with an oil globule .18 mm. in diameter (White Stumpnose, *Chrysophrys globiceps*).

13th November, 1915.—Vegetable matter, a few crustacea, no eggs.

8th-14th January, 1916.—Many copepods and many fish eggs, about 1,000 in all. These eggs were all of the same kind, .59 mm. in diameter and with about a dozen oil globules from .17 mm. to .08 mm. in diameter and a perivittaline space of about .08 mm. In some the oil globules were fewer in number, one having two, one .29 mm. and another .08 mm. in diameter.

16th-22nd January, 1916.—Many hundreds of such eggs.

18th March, 1916.—No eggs.

28th June, 1916.—Small crustacea and crustacean larvae, *Sagitta*, *Beroe*, foraminifera and a few *Noctiluca*. No fish eggs.

From these results of the experimental nettings we are able to answer most of the questions which have been mentioned above.

(1) Certain fish do spawn or breed in the river. The Barbel, for instance, was caught in numbers with its eggs and young, and these are destroyed in netting. No other fish actually in a spawning condition were found, though Steenbras, Kabeljauw and some others had the ovaries well developed. The eggs of the Kabeljauw and White Stumpnose were procured by fine muslin nets in abundance at certain times. That these fish do not, however, resort to the river specially for spawning purposes is shown by the fact that their eggs are found just as abundantly in the open sea. Thus large numbers of spawning Barbel are sometimes procured by fishing boats on

the West Coast, and the "Pieter Faure" in the course of its investigations procured quantities of the ova of Kabeljaauw, Stumpnose, etc., in the open sea. So far as is generally known from scientific investigations, it is only the so-called "anadromous" fish that resort to rivers specially for spawning purposes, and none of the Zwartkops River fish belong to this category.

(2) Spawning does not seem to take place specially in the upper reaches of the river, except in the case of the Barbel.

(3) Such breeding fish do not seem to be disturbed by the netting operations in so far as no diminution on the whole appeared in the nettings throughout the year, and some fish when taken from the net and put into the river made first for the spruit in which they were caught.

(4) No fish eggs were got in the ordinary nettings, except those of the Barbel. Some large eggs attached to weeds were found, but these proved to be the eggs of the Cuttle Fish or Squid. All the other eggs procured were obtained by fine muslin nets, and were minute, transparent and floated on or near the surface of the water. These were quite incapable of being destroyed by netting operations.

(5) No very small fish in the larval stages were procured in the nettings, though many immature fish were found.

(6) The fish in the Zwartkops—more especially the Steenbras, which seem to feed chiefly on the "mud prawns"—seem to remain as a rule in the river and do not pass out and in from the sea.

(7) The fish, from the return, do not seem to have become scarce as a result of the netting, and it does not seem at all probable that they could possibly do so as a result of angling.

(8) Floods of fresh water, it is said, sometimes clear the river completely of fish, killing off those that remain, but it is soon afterwards restocked from the sea.

(9) No sharks were procured in the netting operations.

#### IV.—PARASITIC PROTOZOA IN SOUTH AFRICAN MARINE FISHES.

By H. B. FANTHAM, M.A., Cantab, D.Sc., Lond.

*Professor of Zoology, University College, Johannesburg.*

Various protozoal parasites may be found in fishes—some on the outside of the bodies of the fish (e.g., on skin or gills), others in the digestive tract, and still others in the blood and various internal organs.

As parasites essentially live at the expense of the living tissues of their hosts, it follows that parasites are harmful to their hosts in a greater or lesser degree, and—in the case of fish—detract from their economic food value.

Through the courtesy of the Department of the Administrator through Professor J. D. F. Gilchrist, I was enabled to search for protozoal parasites of fish at St. James' Marine Laboratory near Cape Town, during January and February, 1918. I have much pleasure in tendering my hearty thanks to Dr. Gilchrist for his kindness to me and for the facilities for research which he so generously placed at my disposal.

The Protozoa found may be grouped according to their systematic position, and briefly considered as under.

Among the Sarcodina, parasitic Amoebe may be found in the digestive tracts of fishes, especially in the intestine. In the Bamboo fish, *Box salpa*, I found an Amoeba with nuclear structure closely resembling that of *Amoeba limax*, which was probably not very harmful to the host.

The Mastigophora include the important group of the Flagellata. Parasitic forms such as *Trypanosoma* may occur in the blood, and other Flagellates such as *Trypanoplasma* may occur in the digestive tract. The Trypanosomes are transmitted from fish to fish by leeches. I have seen both blood Flagellates and intestinal Flagellates in South African marine fish.

The Infusoria, which include the important group of the Ciliata, provide two genera of ectoparasites worthy of mention, namely, *Ichthyophthirius* and *Trichodina*. The former occurs on the skin of the host and, when present in large numbers, soon causes death among fish in aquaria, especially among fresh-water fish. The latter parasite, *Trichodina*, lives on the gills of fish. In South Africa I have seen, in company with Professor Gilchrist, a Ciliate on the skin of certain fish, such as Klip fish (*Clinus superciliatus* and *Clinus cottoides*), Harders (*Mugil capito*), Hottentots (*Cantharus blochii*) and Romans (*Chrysophrys globiceps*). The Ciliate, which is allied

to *Ichthyophthirius*, affects marine fish—such as those named—when kept in marine aquaria. In fact, Dr. Gilchrist found it impossible to keep such fish in certain tanks at St. James last spring (1917).

Regarding Ciliates which attach themselves to the gills of fishes during part of their life-cycle, I found numbers of a Ciliate allied to *Trichodina* on the gills of Klip fish (*Clinus taurus* and *Clinus superciliatus*) and Bamboo fish (*Box salpa*). These parasites, like the last-mentioned ones, are probably members of new genera, hitherto undescribed, and are recorded from South African fishes for the first time.

Among the Sporozoa, Haemogregarines have been observed in the red blood corpuscles of fish in different seas. The parasites destroy the red blood cells after multiplying in them, and thereby produce a certain amount of anaemia in the piscine host. The Haemogregarines are transmitted from fish to fish by leeches. I have observed Haemogregarines in several South African fish, and hope to be in a position to observe them further and to describe their structure.

Coccidia occur in the epithelial lining of the alimentary tract of fishes in South Africa, as elsewhere. The parasites multiply in the walls of the intestine, and absorb some of the food of the fish as well as destroying some of the epithelium.

Other interesting Sporozoa, belonging to the Myxosporidia, were observed in the gall-bladder and contained bile of the Bull Klip fish (*Clinus taurus*) at St. James. The bile in this case was somewhat turbid and paler than normal, being of a yellowish colour instead of green. The parasites producing this change belonged to the genus *Myxidium*. The presence of such intruding organisms in the digestive juice, bile, deranges the digestive processes of the fish, as I was able to show when working in Normandy in 1912 in collaboration with Dr. A. Porter.

Spirochaetes are interesting organisms showing affinities with both the Protozoa and the Bacteria, and hence are placed among the Protista. They live in and at the expense of the vital fluids of the host. I have already found Spirochaetes in the blood of young Sand-sharks (*Rhinobatos annulatus*), and in the intestines of certain other South African marine fish.

These parasites, briefly recorded in this note, are only a few of the parasitic Protozoa which might be expected to occur in or on South African fish. They indicate the scope of an investigation which might profitably be undertaken on the parasites of the piscine fauna of the sub-continent, an investigation, indeed, which should be commenced as soon as possible, and in which I should be happy to take part.

V.—CATALOGUE OF FISHES OF THE CAPE PROVINCE.\*

By W. WARDLAW THOMPSON, F.L.S., F.Z.S.

FAMILY **HOPLEGNATHIDAE.**

**Hoplegnathus**, Richards.

*Oplegnathus*, Richardson, Proc. Zool. Soc. 1840, p. 27; Jord. & Fowler, Proc. U.S. Nat. Mus. xxv, 1903, p. 76.

*Scarodon*, Schegel, Fauna Japon. Poiss. p. 89, 1844.

*Hoplegnathus*, Richards. Trans. Zool. Soc. iii, 1842, and Ichth. China, p. 247, 1846 (corrected spelling); Günth. Cat. Fish. iii, p. 357, 1861.

*Ichthyorhamphos*, Casteln. Mém. Poiss. Afr. Austr. p. 35, 1861.

*Scarostoma*, Kner, Sitz. Akad. Wiss. Wien, 1867, p. 715.

**Hoplegnathus algoensis**, Gilchr. & Thomp.

Gilchr. & Thomp., Mar. Biol. Rep. No. 3, p. 56, 1916. (**Algoa Bay**).

**Hoplegnathus pappei**, Cast.

(*Parrot-fish*; *Paptegaai-visch.*)

*Ichthyoramphos pappei*, Casteln. Mém. Poiss. Afr. Austr. p. 35, 1861 (**Kalk Bay**).

*Hoplegnathus conwayi*, Gilchr. Cat. Fish. in Mar. Inv. S.Afr. i, 1902, p. 121 (S. Africa).

*Hoplegnathus pappei*, Regan, Ann. Durban Mus. i, pt. 3, 1916, p. 169 (**Cape**).

FAMILY **SCIAENIDAE.**

**Sciaena (Artedi)**, Linn.

*Sciaena* (part), Artedi, Genera Pisc. 1738.

*Sciaena*, Linnaeus, Syst. Nat. ed. x, p. 289, 1758 Cuv. Règne Anim. ed. i, p. 297, 1817 (restricted to *S. umbra*, a Linnaean species, and *S. aquila*, a non-Linnaean one; not of Cuvier Règne Anim. ed. ii); Günth. Cat. Fish. ii, p. 284, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 1454, 1898.

*Johnius*, Bloch, Ichth. x, p. 107, 1793; Bl. Schn. Syst. Ichth. p. 74, 1801; Cuv. & Val. v, p. 115, 1830.

*Sciaena*, sp. (Artedi) Cuv. Règne Anim. 1817; Cuv. & Val. v, p. 28, 1830.

*Bola*, Ham. Buch. Fish. Ganges, 1822.

*Corvina*, Cuv. Règne Anim. ed. ii, vol. 2, 1829.

\* Continued from p. 135 of Marine Biological Report, No. 3, 1916.

*Leiostomus*, Cuv. & Val. v, p. 140, 1830.

*Cheilotrema*, Tschudi, Fauna Peruana, Fische, p. 13, 1845.

*Homoprion*, Holbrook, Ichth. S. Carolina, p. 168, 1860.

*Rhinoscion*, Gill, Proc. Ac. Nat. Sc. Philad. 1861, p. 85,

*Callaus*, Jordan, Review Sciaenidae, p. 395, 1889.

**Sciaena aquila**, Lacép.

(*Kabeljaauw*, of Cape fishermen; *Cob*, or *Kob*, of East London; *Salmon*, of Natal.)

*Σκίαυρα*, Aristotle, Hist. Anim. viii, cap 19, B.C. 300 (*circa*).

*Umbra*, Bellon. Hist. Nat. Pisc. pp. 117 & 119, 1551; Salvian Aquat. fo. 115a, 1554.

? *Latus*, *Peis-rei*, Rondel. De Pisc. p. 135, 1554.

*Maigre*, *Poisson-royal*, Duhamel, Peches, ii, sect. 6, p. 137, pl. 1, fig. 3, 1777.

*Labrus hololepidotus*, Lacép. Hist. Nat. Poiss. iii, p. 517, pl. 21, fig. 2, 1802 (Ile de France).

*Cheilodipterus aquila*, Lacép. t.c.v. p. 685, 1803 (Mediterranean)

*Sciaena umbra*, Cuv. Mem. Mus. i, p. 1, and Règne Anim. 1817; Bonap. Faun. Ital. Pisc. pl. —, fig. 1, 1841.

*Perca vanloo*, Risso, Ichth. Nice, ed. i, p. 298, pl. 9, fig. 30, 1810.

*Sciaena aquila*, Risso, t.c. ed. ii, vol. iii, p. 411; Neill, in Edinb. New Phil. Journ. 1826, p. 135; Fleming, British An. p. 213, 1828; Cuv. & Val. v, p. 28, pl. 100, 1830 (Mediterranean); Parnell, Fish. Firth of Forth, p. 40, 1838; Yarrell, British Fish. p. 104, 1841; Cuv. Règne Anim. Ill. Poiss. p. 27, fig. 1, 1850 (not Rosenthal); Günth. Cat. Fish. ii, p. 291, 1860 (**Algoa Bay**; Lisbon; British coasts); Day, Brit. Fish. i, p. 150, pl. 1, 1881; Herdm. & Daw. Fish. Irish Sea, p. 39, 1902 (British coasts; “extends almost from Arctic to Antarctic seas and is frequently found on our Southern coasts”); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 122 (**S. Africa**); Regan, Col. Fish. in Ann. Natal Gov. Mus. i, pt. 3, 1908, p. 245 (**Bird Isld.**); Pellegr. Ann. Inst. Oceanog. Tome vi, fasc. iv, 1916, p. 42 (Mauritius).

*Sciaena hololepidotus*, Cuv. & Val. v, p. 53, 1830 (**Cape of Good Hope**); Quoy & Gaim. Voy. *Astrolabe*, Poiss. p. 697, pl. 12, fig. 1, 1834 (**Cape**).

*Sciaena hololepidota*, Smith, Ill. Zool. S. Afr. Pisces, pl. 15, 1849 (Vicinity of **Table Bay**, a staple fish of the Cape market); Pappe, Synops. Ed. Fish. C.G. Hope, p. 15, 1853, or 2nd ed. p. 11, 1866 (Common on the (**S. African**) coast and at mouth of rivers); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 63 (**Cape Seas**); Cast. Mém. Poiss. Afr. Austr. p. 9, 1861 (Very abundant (at **Cape of Good Hope**); adults appear in winter (of the Southern hemisphere) and young are common in summer (January-February)).

**Corvina**, Cuv.

*Corvina*, Cuv. Règne Anim. 2nd. edit. ii, p. 173, 1829; Cuv. & Val. Hist. Nat. Poiss. v, p. 81, 1830; Günth. Cat. Fish. ii, p. 298, 1860; Bouleng. Freshw. Fish. Africa, iii, p. 115, 1915.

**Corvina stellifer**, Bl.

*Bodianus stellifer*, Bl. Ichth. taf. 231, fig. 1, 1870 (**Cape of Good Hope**).

*Corvina trispinosa*, Cuv. & Val. v, p. 109, 1830 (Brazil; Cayenne); Steindr. Sciaenoiden Brasiliens, p. 14, 1863; ? Gay, Hist. Chile, Zool. ii, p. 184, 1848.

*Corvina stellifera*, Günth. Cat. Fish. ii, p. 299, 1860 (West Indies).

*Sciaena (Stelliferus) stellifera*, Jord. Proc. U.S. Nat. Mus. 1886, p. 540 (notes on type of *trispinosa*).

*Stelliferus stellifer*, Jord. & Eigenm. Rep. U.S. Fish Comm. 1889, p. 394.

*Stellifer stellifer*, Jord. & Everm. Fish. N. and Mid. Amer. p. 1443, 1898 (Coasts of Guiana, Brazil, rather common; Bahia).

**Otolithus**, Cuv.

Cuv. Règne Anim. 2nd ed., ii, p. 172, 1829; Cuv. & Val. Hist. Nat. Poiss. v, p. 59, 1830; Günth. Cat. Fish. ii, p. 305, 1860; Bouleng. Poiss. Bass. Congo, p. 384, 1901, and Freshw. Fish. Africa, iii, p. 117, 1915.

*Pseudotolithus*, Bleeker, Nat. Verh. Ges. Haarlem, xviii, 1863, no. 2, p. 59.

**Otolithus acquidens**, Cuv. & Val.

(*Geel-bek*; *Cape Salmon*.)

Cuv. & Val. v, p. 66, 1830 (**Cape**); Smith, Ill. Zool. S. Afr. Pisces, pl. 13, 1849 (Abundant in seas round southern point of Africa and is often caught in numbers in **Table Bay**); Blkr. Visch v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 64, (**Mossel Bay**); Günth. Cat. Fish. ii, p. 306, 1860 (**Cape Seas**); Cast. Mém. Poiss. Afr. Austr. p. 10, 1861 (Found in abundance especially in **Simons Bay** during the summer, January-February-March); Pappe, Synops. Ed. Fish. C.G. Hope, 1853, and 2nd ed., p. 11, 1866 (common along the **whole coast**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 122 (**S. Africa**); Regan, Col. Fish. in Ann. Natal. Gov. Mus. i, pt. 3, 1908, p. 245 (**Bird Isld.**).

**Umbrina**, Cuv.

*Umbrina*, Cuv. Règne Anim. p. 297, 1817 (*Sciaena*, Linn. being restricted to *S. umbra*, a Linnaean and *S. aquila*, a non-Linnaean species); Cuv. & Val. Hist. Nat. Poiss. v, p. 171, 1830; Günth. Cat. Fish. ii, p. 273, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 1465, 1898.

*Sciaena*, Bleeker, Poiss. de la cote de Guinée, in Nat. Verh. Holl. Maatsch. Wetensch. 2 Verz. Deel xviii, 1863, p. 66.

**Umbrina Capensis**, Pappe.

(*Baardmannetje*).

Pappe, Synops. Ed. Fish. C.G. Hope, 1st ed. p. 16, 1853, 2nd ed. p. 11, 1866 (Chiefly caught in **False Bay** during summer); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 54, Name only, (**Cape Seas**); Cast. Mém. Poiss. Afr. Austr. p. 10, 1861 (Very rare; **Simons Bay** during summer); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. 1, 1902, p. 122 (**S. Africa**); Regan, Col. Fish. in Ann. Natal Gov. Mns. i, pt. 3, 1908, p. 245 (**Bird Isld.**).

**Umbrina cirrhosa**, Linn.

*Glaucus*, Bellon. Hist. Nat. Pisc. i, p. 103, fig. in p. 105, 1551; Gesner, Aquat. iv, p. 390, 1558.

*Chromis*, Bellon, t.c. p. 106, fig. in p. 107, 1551; Gesner, t.c. p. 224, 1558.

*Umbra*, Rondel. De. Pisc. i, lib. v, p. 132, 1554; Gesner, t.c. p. 1030, 1558; Willughby, Hist. Pisc. iv, p. 299, tab. S. 21, 1686.

*Coracinus*, Salvian. Aquat. p. 117, fig. 34, 1554; Aldrov. De Pisc. i, p. 72, 1638.

*Sciaena*, sp. 1, Artedi, Synon. p. 65, Gen. p. 38, 1738; Gronov. Zoophyl. no. 212, 1763.

*Sciaena cirrhosa*, Linn. Syst. Nat. ed. xii, i, p. 481, 1766; Bl. Ichth. tab. 300, 1797.

*Jhonius cirrhosus*, Bl. Schn. Syst. Ichth. p. 76, 1801.

*Perca umbra*, Lacép. Hist. Nat. Poiss. iv, p. 414, 1802 (Mediterranean; Egypt; Antilles); Risso, Ichth. Nice, p. 297, 1810.

*Chilodipterus cyanopterus*, Lacép. t.c. iii, p. 546, pl. 6, fig. 3, 1802 (Central or tropical America).

*Corracinus boops*, Pallas, Zoogr. iii, p. 259, 1811.

*Umbrina cirrhosa*, Cuv. Régne Anim. 1817; Risso, Eur. Mérid. iii, p. 409, 1827; Bonap. Fauna Ital. Pesc. pl. —, fig. 3, 1841; White, Cat. British Fish. p. 15, 1851; Günth. Cat. Fish. ii, p. 274, 1860 (**Algoa Bay**; Mediterranean); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 121 (**S. Africa**).

*Umbrina vulgaris*, Cuv. & Val. v, p. 171, 1830 (Coasts of France, Spain, Italy); Yarrell, British Fish. i, p. 109, 1836; Nordm. in Demid. Voy. Russ. Mérid. Zool. p. 383, pl. 3, fig. 2, 1840; Cuv. Régne Anim. Ill. Poiss. pl. 28, fig. 3, 1850.

*Sciaena cestreus*, Gronov. Syst. ed. Gray, p. 52, 1854 (Mediterranean; American Seas).

*Skeleton*, Agassiz, Poiss. fossiles, iv, p. 178, tab. K. (*Sciaena cirrhosa*).

## FAMILY GERRIDAE.

**Gerres**, Cuv.

*Gerres*, Cuv. Règne Anim. 2nd ed. ii, p. 104, 1829; Günth. Cat. Fish. iv, p. 252, 1862.

*Catochoenum*, Cantor, Cat. Malayan Fish. p. 55, 1849; substitute for *Gerres*, Cuvier, regarded by Cantor as pre-occupied by *Gerris*, Fabricius, 1794, a genus of Insects. *Gerres*, *Diapterus*, et *Synistius*, Gill, Proc. Ac. Nat. Sc. Philad. 1862, p. 238.

*Xystaema*, Jord. & Everm. Fish. N. and Mid. America, p. 1372, 1898.

**Gerres longirostris**, Rapp.

Rapp; Günth. Proc. Zool. Soc. 1861, p. 142, pl. 24, and Cat. Fish. iv, p. 253, 1862 (**Cape of Good Hope**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 140 (**S. Africa**); Regan, Col. Fish. in Ann. Natal Gov. Mus. i, pt. 3, 1908; p. 245 (Durban Bay; Kosi Bay); Gilchr. & Thomp., Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 158 (Natal).

## FAMILY HAPLODACTYLIDAE.

**Chilodactylus**, Lacép.

*Cheilodactylus*, (Lacép.), Cuv. Règne Anim. 1817; Cuv. & Val. Hist. Nat. Poiss. v, p. 356, 1830.

*Chilodactylus*, Günth. Cat. Fish. ii, p. 78, 1860.

**Chilodactylus brachydactylus**, Cuv. & Val.

(*Steenklip visch*).

*Cheilodactylus brachydactylus*, Cuv. & Val. v, p. 361, 1830. (**Cape of Good Hope**); Pappe, Synops. Ed. Fish. C. G. Hope, 1st ed. p. 17, no. 9, 1853, 2nd ed. p. 12, 1866 (*Steenklipvisch*, *Pampelmoesje*; among rocks at **Sea Point**); Blkr: Visch. v d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 52, Name only, (**S. Africa**); Cast. Mém. Poiss. Afr. Austr. p. 11, 1861 (*Steenklipvisch* et *Pompelmoesjes*. Very rare, said only to be found among rocks at **Green Point, near Cape Town**).

*Chilodactylus brachydactylus*, Günth. Cat. Fish. ii, p. 81, 1860 (**Cape of Good Hope**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 118 (**S. Africa**).

**Chilodactylus fasciatus**, Lacép.

(*Steen-visch*).

*Cynaedus cauda bifurcata*, Gronov. Zoophyl. p. 64, no. 221, pl. 10, fig. 1, 1763.

*Cheilodactylus fasciatus*, Lacép. Hist. Nat. Poiss. v, p. 6, pl. 1, 1803 (No locality stated); Cuv. & Val. v, p. 357, 1830 (**Cape**); Pappe, Synops. Edib. Fish. C. G. Hope, 1st ed. p. 16, no. 8, 1853, and 2nd ed. p. 11, 1866 (*Steenvisch*); [C.P. 3—1918]

not very abundant in **Table Bay**); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. i, 1860, p. 63 (**Cape Seas**); Casteln. Mém. Poiss. Afr. Austr. p. 11, 1861 (Very common in **Cape market** during winter).

*Trichopterus indicus*, Gronov. Syst. ed. Gray, p. 162, 1854 (India).

*Chilodactylus fasciatus*, Günth. Cat. Fish. ii, p. 81, 1860 (**Cape of Good Hope**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 117 (**S. Africa**).

### **Chilodactylus grandis**, Günth.

Günth. Cat. Fish. ii, p. 79, 1860 (**Cape Seas**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 118 (**S. Africa**).

### **Chilodactylus multiradiatus**, Cast.

*Cheilodactylus multiradiatus*, Casteln. Mém. Poiss. Afr. Austr. p. 12, 1861 (Colony of the **Cape of Good Hope**).

*Chilodactylus multiradiatus*, Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1890, p. 118 (**S. Africa**).

## FAMILY **POMADASIDAE**.

### **Pomadasys**, Lacép.

*Pomadasis*, Lacép. Hist. Nat. Poiss. iv, p. 516, 1803; Jord. & Fowler, Sparoid Fish. Eur. & Amer. in Rept. Comm. Fish & Fisheries, 1889-1891 (1893), p. 489; Jord. & Everm. Fish. N. and Mid. Amer. p. 1329, 1898.

*Pristipoma*, Oken, Isis, 1817; Cuv. Règne Anim. 2nd ed. ii, p. 176, 1829; Cuv. & Val. Hist. Nat. Poiss. v, p. 243, 1830; Günth. Cat. Fish. i, p. 286, 1859; Bouleng. Fish. Bass. Congo, p. 386, 1901, and Freshw. Fish. Africa, iii, p. 125, 1915.

*Les Pristipomes*, Cuv. Règne Anim. ed. i, p. 279, 1817.

*Brachydeuterus*, Gill. Proc. Acad. Nat. Sc. Philad. 1862, p. 17.

*Haemulopsis*, Steindr. Ichth. Notizen, viii, 1869, p. 9.

*Pseudopristipoma*, Sauvage, Bull. Sc. Philom. iv, 1880, p. 220.

*Rhencus*, Jord. & Everm. Check-List. p. 387, 1896.

*Rhonciscus*, Jord. & Everm. l. c. p. 387.

*Pomadasys*, corrected orthography.

### **Pomadasys opercularis**, Playfr.

(*Spotted Steenbras*, of Simons Bay; *Tiger*, of Port Elizabeth; *Grunter*, of Natal).

*Pristipoma operculare*, Playfr. Fish. Zanzibar, p. 25, pl. iv, fig. 1, 1866 (Aden); Day, Fish. India, p. 76, pl. xx, fig. 2, 1875 (East Coast Africa to Sind, where it is common);

Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 110 (**S. Africa**) ; Gilchr. & Thomp. Ann. S. Afr. Mns. vi, pt. 2, 1908, p. 152 (Durban).

*Pomadasys opercularis*, Steindr. Fische Süd.-arab. en Sokotra, p. 40, name only, 1902 (East coast of Arabia) ; Regan, Col. Fish. in Ann. Natal Gov. Mus. i, pt. 3, 1908, p. 243 (Durban Bay).

### **Pomadasys suillum**, Cuv. and Val.

*Pristipoma suillum*, Cuv. and Val. ix, p. 482, 1833 (Gorea) ; Günth. Cat. Fish. i, p. 302, 1859 (Cape Verde) ; Steindr. Sitz. Ak. Wiss. Wien, Ix, 1869, p. 682, pl. v ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 110 (**S. Africa**) ; Pellegr. Ann. Inst. Oceanogr. 1914, tome vi, fasc. iv, p. 46 (Gorea ; coast of Senegambia ; Lobito, Angola ; Banana, Congo Estuary).

*Pristipoma rangi*, Cuv. and Val. t.c.p. 484.

*Pristipoma operculare*, Day, Fish. India, p. 76, 1875 ("A specimen of *P. suillum* C. and V. at Berlin from the **Cape of Good Hope** makes it doubtful whether *P. operculare* may not prove to be a variety of that species").

## FAMILY SPARIDAE.

### **Dentex**, Cuv.

Cuvier, Règne Anim. 1st ed. ii, p. 272, 1817, and 2nd ed. p. 184, 1829 ; Cuv. and Val. Hist. Nat. Poiss. vi, p. 212, 1830 ; Günth. Cat. Fish. i, p. 366, 1859.

### **Dentex albus**, Gilchr.

(*Witte-visch*, of Table Bay fishermen.)

Gilchr. Mar. Biol. Rept. ii, 1914, p. 128 (**Table Bay**).

### **Dentex argyrozona**, Cuv. & Val.

(*Silver-fish*, of the Cape.)

Cuv. & Val. vi, p. 235, 1830 (**Cape of Good Hope**) ; Smith, Ill. Zool. S. Afr. Pisces, pl. 19, 1849 (Silver-fish ; East and West coasts of **South Africa**, very common in the **Cape market**) ; Pappe, Synops. Ed. Fish. C. G. Hope, p. 21, no. 20, 1853, and 2nd ed. p. 15, 1866 (Common on the **Cape market** throughout the year) ; Günth. Cat. Fish. i, p. 361, 1859 (**Cape of Good Hope** ; **Cape Seas** ; **False Bay**) ; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, pp. 49 and 59 (**Cape Seas**) ; Casteln. Mém. Poiss. Afr. Austr. p. 29, 1861 (Common in the **Cape market**, abundant all the year in **Table and Simons Bays**) ; Kner, *Novara*, Fische, p. 63, 1865 ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 108 (**S. Africa**) ; Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 244 (**Bird Island**).

**Dentex brevis**, Kner.

*Dentex (rupestrus C. & V.?) brevis*, Kner, Novara, Fische, p. 61, 1865 (**Cape of Good Hope**).

*Dentex brevis*, Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 109 (**S. Africa**).

**Dentex filosus**, Valenc.

*Dentex filosus*, Valenc. in Webb & Berth. Iles Canaries, Poiss. p. 37, 1836; Guichen. Explor. Scient. Algér. Poiss. p. 52, 1850; Günth. Cat. Fish. i, p. 371, 1859 (**Cape Seas**; Canary Islds.; coast of Algiers); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 109 (**S. Africa**); Gilchr. & Thomp. Ann. S. Afr. Mus. xi, pt. 2, 1911, p. 32 (Natal); Pellegr. Ann. Inst. Oceanogr. tome vi, fasc. iv, 1914, p. 50 (Cap Blanc and Mauritius coasts; Mossamedes; coasts of Algeria, West Africa and Atlantic to the **Cape**; Senegal).

*Dentex filamentosus*, Valenc. t.c.p.6., 1836 (not Cuv. & Val).

**Dentex macrocephalus**, Lacép.

*Labrus macrocephalus*, Lacép. Hist. Nat. Poiss. iii, p. 480, pl. 26, fig. 1, 1802 (Indian Ocean; South Sea Islds.).

*Dentex macrocephalus*, Cuv. & Val. vi, p. 232, 1830 (**Cape of Good Hope**); Cuv. Règne Anim. Ill. Poiss. pl. 35, fig. 2, 1850; Günth. Cat. Fish. i, p. 366, 1859 (Locality not stated); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 52, name only (**Cape Seas**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 109 (**S. Africa**).

**Dentex macrodens**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 30, 1861 (**Algoa Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 109 (**S. Africa**).

**Dentex praeorbitalis**, Günth.

Günth. Cat. Fish. i, p. 368, 1859 (**Cape Seas**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 109 (**S. Africa**); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 157 (Natal).

**Dentex rupestris**, Cuv. & Val.

(*Red Steenbras*.)

*Dentex rupestris*, Cuv. & Val. vi, p. 231, 1830 (Rood-Steenbrasse. **Cape of Good Hope**); Smith, Ill. Zool. S. Afr. Pisces, pl. 14 (not good), 1849 (Seas of **Southern Africa**); Owen, Osteol. Cat. i, p. 60, 1853; Günth. Cat. Fish. i, p. 370, 1859 (**Cape Seas**).

*Chrysophrys laticeps*, Pappe, Synops. Edib. Fish. C. G. Hope, p. 18, no. 13, 1853, and 2nd ed. p. 13, 1866 (*Roode Steenbrasen*. Not very common in **Table Bay**, but caught abundantly in **False Bay** and on the shores of **Hottentots Holland**); Castel. Mém. Poiss. Afr. Austr. p. 23, 1861 (*Roode Steenbrassem*. Abundant during summer in **Simons Bay**; sometimes taken in **Table Bay**).

**Dentex undulosus**, Regan.

(*Seventy-four*, of the Cape; *Silver-fish*, of Algoa Bay.)

*Dentex rupestris* (non Cuv. & Val.), Pappe, Synops. Edib. Fish. C. G. Hope, p. 21, no. 19, 1853, and 2nd ed. p. 15, 1866 (*Bastard Silver-fish*: *Seventy-four*. Rarely found in **Table Bay**; chiefly confined to **East of the Cape**); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, pp. 52 and 59 (*Roode Steenbrass*; *Bastard Silver-fish*; *Seventy-four*; **Cape Seas**); Casteln. Mém. Poiss. Afr. Austr. p. 28, 1861 (*Seventy-four* of the Cape; *Silver-fish* of Algoa Bay. **L'Agulhas Bank, Kalk Bay, Algoa Bay**, said to be caught sometimes in **Table Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 109 (**S. Africa**). *Dentex undulosus*, Regan, Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 252, pl. xl (16 m. N.E. of **Bird Isld.**, Natal, **Table Bay**), and Col. Fish. (*ibid*) p. 244 (**Bird Isld.**).

**Caesio**, (Commers.) Cuv.

*Caesio* sp. (Commers.) Cuv. Règne Anim. 1817.

*Caesio*, Cuv. & Val. Hist. Nat. Poiss. vi, p. 426, 1830, Günth. Cat. Fish. i, p. 390, 1859.

**Caesio apillaris**, Blgr.

(*Windtoy*.)

*Caesio apillaris*, Bouleng. Mar. Inv. S. Afr. i, 1902, p. 10, pl. i (**False Bay**, 20 fms.); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 110 (**S. Africa**).

? *Cantharus blockii* (non Cuv. & Val.), Pappe, Synops. Edib. Fish. C. G. Hope, p. 21, no. 21, 1853, and 2nd ed. p. 15, 1866 (*Windtoy*. **Cape of Good Hope**; more commonly caught in winter); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, (**Cape Seas**).

? *Cantharus brama*, Casteln. Mém. Poiss. Afr. Austr. p. 31, 1861 (*Windtoy*. Very rare and not found in **Table Bay** except after strong winds, sometimes as their precursor).

**Cantharus**, Cuv.

Cuv. Règne Anim. p. 278, 1817; Cuv. & Val. Hist. Nat. Poiss. vi, p. 318, 1830; Günth. Cat. Fish. i, p. 413, 1859.  
[C.P. 3—1918]

**Cantharus blochii**, Cuv. & Val.

(Hottentot.)

*Sparus brama*, Bl. Ichth. taf. 279 (not descr.), 1797.*Cantharus blochii*, Cuv. & Val. vi, p. 339, 1830 (**Cape of Good Hope**) ; Günth. Cat. Fish. i, p. 416, 1859 (**Cape Seas** ; **False Bay**) ; ? Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, pp. 49 and 52, name only (**Cape of Good Hope**) ; Kner, *Novara*, Fische, p. 24, 1865 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. III (**S. Africa**).*Sargus capensis*, Pappe, Synops. Edib. Fish. C. G. Hope, p. 17, no. 11, 1853, and ed. 2, p. 12, 1866 (Mostly confined to **Table Bay** and **West coast**, where it is found abundantly) ; Casteln. Mém. Poiss. Afr. Austr. p. 17, 1861 (Commonest fish in **Table Bay** ; abundant in the market all the year round).**Cantharus castelnau**, Blkr.Bleeker, Visch. v. d. Kaap, pp. 52 and 59, 1860 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. III (**S. Africa**).**Cantharus elongatus**, Cast.Casteln. Mém. Poiss. Afr. Austr. p. 32, 1861 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. III (**S. Africa**).**Cantharus emarginatus**, Cuv. & Val.

(Steenje.)

Cuv. & Val. vi, p. 338, 1830 (**Cape of Good Hope**) ; Pappe, Synops. Ed. Fish. C. G. Hope, p. 22, no. 21, 1853, and 2nd ed. p. 15, 1866 (*Dasje*). Rare in **Table Bay**, but more frequently caught in bays to the east of the **Cape** ; Günth. Cat. Fish. i, p. 416, 1859 (**Cape Seas**) ; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 60 (*Dasje* ; **Cape Seas**) ; Casteln. Mém. Poiss. Afr. Austr. p. 32, 1861 (**Cape of Good Hope**) ; Kner, *Novara*, Fische, p. 73, 1865 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. III (**S. Africa**) ; Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 244 (**Bird Isld.**).**Box**, Cuv. & Val.*Cynædus*, Gronov. Zoophyl. 1763 (*non-binomial*).*Boops*, Cuv. Règne Anim. p. 270, 1817.*Box*, Cuv. & Val. Hist. Nat. Poiss. vi, p. 346, 1830 ; Günth. Cat. Fish. i, p. 419, 1859 ; Jordan & Fessler, Sparoid. Fish. Amer. Eur. in Rept. Comm. Fish. and Fisheries, 1889-1891 (1893), p. 529.

**Box salpa**, Linn.

(*Bamboo-fish*, of Cape; *Striped Karanteen*, of Natal.)

**Σαλπη**, Aristotle, Hist. Anim. iv, cap. 8; cap. 9, 10; vi, cap. 17; viii, cap. 2, 13; ix, cap. 37, B.C. 300 (*circa*); Ælian, De Anim. Nat. ix, cap. 7, p. 516, A.D. 120; Athen. Deipnos. vii, p. 320, A.D. 150; Oppian, De Pisc. i, p. 6, A.D. 200.

*Salpa*, Ovid, Halient. v, p. 121; Pliny, Hist. ix, cap. 57; Bellon. De Aquat. pp. 187 and 189, 1553; Gesner, Hist. pp. 832 and 979, 1558; Rondel. Aquat. v, cap. 23, p. 154, 1560; Aldrov. De Pisc. ii, cap. 21, p. 189, 1638; Willughby, Hist. Pisc. p. 316, 1686; Ray, Synops. p. 134, 1713.

*Sparus No.* 15, Artedi, Gen. Pisc. p. 38, 1738.

*Sparus salpa*, Linn. Syst. Nat. ed. xii, i, p. 470, 1766; Brun. Pisc. Massil. p. 46, 1768 (Marseilles); Gmel. Linn. Syst. Nat. p. 1275, 1793; Bl. Ichth. taf. 265, 1797; Bl. Schneid. Syst. Ichth. p. 270, 1801; Lacép. Hist. Nat. Poiss. iv, pp. 97 and 101, 1802 (Mediterranean); Risso, Ichth. Nice, p. 243, 1810.

*Cynaedus*, Gronov. Zoophyl. no. 216, 1763.

*Box salpa*, Cuv. & Val. vi, p. 357, 1830 (Mediterranean); Webb & Berth. Hist. Nat. Iles Canaries, Poiss. p. 36, 1836; Guichen. Explor. Sc. Algérie, Poiss. p. 54, 1850; Günth. Cat. Fish. i, p. 420, 1859 (**Cape Seas**; Mediterranean; Malta; Sicily; Lanzerote; Madeira); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 116 (**S. Africa**); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 165 (Natal); Pellegr. Ann. Inst. Oceanogr. tome vi, fasc. iv, 1914, p. 52 (Cap Blanc and coasts of Mauritius; Mossamedes; Méditerranéan; Canaries; Senegal; **Cape**).

*Boops salpa*, Pappe, Synops. Edib. Fish. C. G. Hope, 1853, and ed. 2, p. 16, 1866 (*Bamboes-visch*; *Stinkfish*; scarce on the Cape Town market, is common in **Saldanha Bay**); Casteln. Mém. Poiss. Afr. Austr. p. 31, 1861 (*Bamboes-visch*; *Stinkfish*. **Table Bay**; **Simon's Bay**; **Algoa Bay**).

**Crenidens**, Cuv. & Val.

Cuv. & Val. Hist. Nat. Poiss. vi, p. 377, 1830; Günth. Cat. Fish. i, p. 424, 1859.

**Crenidens forskalii**, Cuv. & Val.

(*White Karanteen*, of Natal.)

*Sparus crenidens*, Forsk. Descr. Anim. p. 15, 1775 (Red Sea). *Crenidens forskalii*, Cuv. & Val. vi, p. 377, pl. 162, 1830 (Red Sea); Rüpp. N. W. Fische, p. 120, 1838; Peters, Wieg. [C.P. 3—1918]

Arch. 1855, p. 243; Günth. Cat. Fish. i, p. 424, 1859 (Red Sea; coast of Mossambique); Casteln. Mém. Poiss. Afr. Austr. p. 32, 1861 (Natal); Day, Fish. India, p. 133, 1875 (Red Sea; seas of India, Sind, and coast of Mossambique); Blkr. Arch. Néerl. Sc. Nat. xi, 1876, pt. 1, p. 284; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 117 (**S. Africa**); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 164 (Natal).

**Pachymetopon**, Günth.

Günth. Cat. Fish. i, p. 424, 1859.

**Pachymetopon grande**, Günth.

Günth. Cat. Fish. i, p. 424, 1859 (Locality not stated), and *Challenger*, Shore Fishes, p. 406, 1880 (**Cape of Good Hope**); Blkr. Arch. Néerl. Sc. Nat. xi, 1876, pt. 2, p. 295; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 116 (**S. Africa**).

**Pachymetopon guentheri**, Steindr.

Steindr. Wien Sitzgsber. 1869, lx, p. 135 (**Cape of Good Hope**).

**Dipterodon**, Cuv. & Val.

Cuv. & Val. Hist. Nat. Poiss. vii, p. 274, 1831; Günth. Cat. Fish. i, p. 426, 1859.

**Dipterodon capensis**, Cuv. & Val.

(*Galjoen-fish*; *Galleon*.)

*Coracinus*, Gronov. Zoophyl. no. 226, 1763 (**Cape of Good Hope**).

*Dipterodon capensis*, Cuv. & Val. vii, p. 276, pl. 188, 1831 (**Cape of Good Hope**); Cuv. Règne Anim. Ill. Poiss. pl. 43, fig. 2, 1850; Pappe, Synops. Edib. Fish. C.G. Hope, p. 23, no. 24, 1853, and ed. 2, p. 16, 1866 (*Galjoen-visch*, *Galleon-visch*; more plentiful in the **Western Division of Cape Colony**); Günth. Cat. Fish. i, p. 426, 1859 (**Cape Seas**); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, pp. 50 and 63 (**Cape Seas**); Casteln. Mém. Poiss. Afr. Austr. p. 34, 1861 (*Galleon-fish*; **West coast of Cape Colony**; caught in **Table Bay** in summer); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 116 (**S. Africa**); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 165 (Natal).

*Coracinus afer*, Gronov. Syst. ed. Gray, p. 57, 1854 (**Cape of Good Hope**).

**Diplodus**, Rafinesque.

*Diplodus*, Rafinesque, Ind. d'Ittiol. Siciliana, p. 54, 1810; Jord. & Everm. Fish. N. and Mid. Amer. p. 1362, 1898.

*Sargus*, Cuv. Règne Anim. ed. i, p. 272, 1817 (name pre-occupied in Insects); Cuv. & Val. Hist. Nat. Poiss. vi, p. 9, 1830; Günth. Cat. Fish. i, p. 437, 1859.

**Diplodus cervinus**, Lowe.

(*Wilde-paard* ; *Streep-dasje*.)

*Charax cervinus*, Lowe, Trans. Zool. Soc. ii, 1841, p. 177 (Madeira).

? *Sargus cervinus*, Valenc. in Webb & Berth. Hist. Nat. Iles Canaries, p. 29, 1836-1850.

*Sargus fasciatus*, Valnec. t.c. pl. 9, fig. 2 (not description).

*Sargus hottentotus*, Smith, Ill. Zool. S. Afr. Pisces, pl. 23, fig. 1, 1849 (Seas of S.E. coast of **Southern Africa** and frequently found in some of the larger rivers); Pappe, Synops. Edib. Fish. C.G. Hope, p. 17, no. 10, 1853, and 2nd ed. p. 12, 1866 (Common to **Table Bay** from June to August, *Hangberger*); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 52, name only (**Cape Seas**); Casteln. Mém. Poiss. Afr. Austr. p. 17, 1861 (*Hangberger*). Found in **Table Bay** during the winter months, June to August); Kner, *Novara*, Fische, p. 78, 1865 (**Cape**).

*Sargus cervinus*, Günth. Cat. Fish. i, p. 448, 1859 (**Cape Seas**; Madeira; Canaries); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 113 (**S. Africa**); Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 244 (Kosi Bay); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 167 (Natal); Pellegr. Ann. Inst. Oceanogr. tome vi, fasc. iv, 1914, p. 53 (Cap Blanc; Madeira; Canaries; **Cape of Good Hope**).

**Diplodus holubi**, Steindr.

*Sargus holubi*, Steindr. Ichth. Beitr. x, 1881, p. 30, taf. iii (**Algoa Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 114 (**S. Africa**); Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 244 (Kosi Bay; Durban Bay).

**Diplodus rondeletii**, Smith, var. *capensis*, Blgr.

(*Dasje*.)

*Sargus capensis*, Smith, Ill. Zool. S. Afr. Pisces, pl. 23, fig. 2, 1849 (Seas of S.E. coast of **Southern Africa** and frequently found in some of the larger rivers); Günth. Cat. Fish. i, p. 442, 1859 (**Cape Seas**), and *Challenger*, Shore Fishes, pp. 9, 10, name only, 1880 (Bermuda); Blkr. Visch v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 52, name [C.P. 3-1918]

only (**Cape Seas**) ; Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 244 (Kosi Bay ; Durban Bay).

*Sargus rondeletii*, Casteln. Mém. Poiss. Afr. Austr. p. 18, 1861 (**Gamtoos River** ; **Algoa Bay** ; East coast of **Cape Colony**) ; Playfair, Fish. Zanzibar, p. 43, 1866 (South Arabia) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 113 (**S. Africa**).

*Sargus kotschy*, Steindr. Sitzb. Ak. Wien. 1877, p. 203.

*Sargus rondeletii* var. *capensis*, Bouleng. Proc. Zool. Soc. 1887, p. 658 ; Steindr. Fische Süd-arab & Sokotra, Denks. Ak. Wiss. Wien, lxxi, 1902, p. 41, name only (East coast Arabia).

### **Pagrus**, Cuv.

Cuv. Règne Anim. ed. i, p. 272, 1817 ; Cuv. & Val. Hist. Nat. Poiss. vi, p. 141, 1830 ; Günth. Cat. Fish. i, p. 465, 1859.

#### **Pagrus holubi**, Steindr.

(*Fransche Madame.*)

*Pagrus (Chrysophrys) holubi*, Steindr. Ichth. Beitr. x, 1881, p. 25, taf. ii. (**Algoa Bay**).

*Chrysophrys holubi*, Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 113 (**S. Africa**).

#### **Pagrus laniarius**, Cuv. & Val.

(*Panga*.)

*Pagrus laniarius*, Cuv. & Val. vi, p. 163, 1830. (**Cape of Good Hope**) ; Günth. Cat. Fish. i, p. 467, 1859 (**Cape Seas** ; **False Bay**) ; Kner, *Novara*, Fische, p. 85, 1865 ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 114 (**S. Africa**) ; Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 244 (**Bird Isld.**).

*Pagelius afer*, Pappe, Synops. Edib. Fish. C.G. Hope, p. 20, no. 18, 1853, or 2nd ed. p. 14, 1866 (*Rhoode Kaapsche Stompeus* ; pretty common on the **Cape market**) ; Blkr. Visch v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 52, name only (**Cape Seas**) ; Casteln. Mém. Poiss. Afr. Austr. p. 27, 1861 (rarely taken in **Table Bay** ; **Algoa Bay**).

#### **Pagrus nigripinnis**, Blgr.

(*Black Biskop* ; *Mussel-cracker*, of Natal.)

*Chrysophrys nasutus*, Casteln. Mém. Poiss. Afr. Austr. p. 24, 1861 (*Biscop*. Very rare ; a single specimen taken in **Table Bay**).

*Pagrus nigripinnis*, Bouleng. Ann. S. Afr. Mus. iii, pt. 3, 1903, p. 67, pl. vii (Coast of Natal); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 169 (Natal).

### **Pagrus unicolor**, Q. & G.

*Chrysophrys unicolor*, Quoy & Gaim. Voy. *Uranie*, p. 299, 1824.  
*Pagrus unicolor*, Cuv. & Val. vi, p. 162, 1830 (New Holland);  
 Richards, Ichth. China, p. 242, 1846; Gunth. Cat. Fish. i, p. 468, 1859 (**Cape of Good Hope**; New Zealand; Norfolk Isld.; Port Jackson; Moreton Isld.; Australia; ? Hong Kong); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 114 (**S. Africa**).

*Pagrus guttulatus*, Cuv. & Val. vi, p. 160, 1830 (New Holland; New Zealand); Lesson, Voy. *Coquille*, Poiss. ii, p. 188, 1838.

### **Pagellus**, Cuv. & Val.

Cuv. & Val. Hist. Nat. Poiss. vi, p. 169, 1830; Günth. Cat. Fish. i, p. 473, 1859.

### **Pagellus affinis**, Blgr.

(*Rooi Chor-chor*, of Mossel Bay.)

Bouleng. Proc. Zool. Soc. 1887, p. 659 (**Cape of Good Hope**; Arabia); Steindr. Fische Süd-arab & Sokotra, p. 12, taf. ii, fig. 1, 1902 (Sokotra; Gischin); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909 (Durban market).

### **Pagellus armatus**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 37, 1861 (Only once seen in the **Cape market**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 115 (**S. Africa**).

### **Pagellus erythrinus**, Linn.

*Ἐρυθρίνος*, Aristotle, Hist. Anim. i, iv, cap. 11.

*Erythrinus*, Bellon. De Aquat. p. 185, 1553; Salvian, f. 239, 1554 (Venice); Gesner, Hist. p. 365, 1558; Rondel. Aquat. v, cap. 16, p. 144, 1560; Aldrov. De Pisc. ii, cap. 9, p. 154, 1638 (Sicily); Willughby, Hist. Pisc. cap. 10, p. 311, tab. 5, fig. 6, 1686; Ray, Synops. p. 134, 1713.

*Sparus* no. 3, Artedi, genera Pisc. p. 36, 1738.

*Sparus erythrinus*, Linn. Syst. Nat. i, p. 469, 1766; Duhamel, Pêches, iv, cap. 2, p. 29, 1777; Gmel. Linn. Syst. Nat. p. 1272, 1793; Bl. Schn. Syst. Ichth. p. 275, 1801; Shaw, Nat. Misc. xx, pl. 834, 1803; Risso, Ichth. Nice, p. 240, 1810 (Nice); Martens, Reise n. Venedig, ii, p. 425, 1824 (Venice).

*Sparus pagellus*, Lacép. Hist. Nat. Poiss. iv, pp. 85 & 92, 1802 (Mediterranean ; Atlantic Ocean ; "grande ocean equinoctial ;" sea of Japan).

*Pagrus erythrinus*, Risso, Eur. Mérid. iii, p. 361, 1827.

*Pagellus erythrinus*, Cuv. & Val. vi, p. 170, pl. 150, 1830 (Mediterranean ; the Ocean) ; Yarrell, British Fish. i, p. 120, fig. copied from Cuv. & Val. (not description and vignete : not White) 1836 ; Parnell, Fish. Firth of Forth, p. 43, pl. 27, 1838 ; Nordm. in Demid. Voy. Russ. Merid. p. 388, 1840 ; Guichen. Explor. Sc. Alger. Poiss. p. 50, 1850 ; Couch, in Loudon's Mag. Nat. Hist. v, p. 17, fig. 3, 1852 ; Günth. Cat. Fish. i, p. 473, 1859 (British coasts ; Lisbon ; Orotava ; Santa Cruz, Teneriffe ; Adriatic : mouth of Danube ; **? Cape Seas**—a single specimen) Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 115 (**South Africa**) ; Pellegr. Ann. Inst. Oceanogr. Poiss. tome vii, fasc. iv, 1914, p. 54 (Cap. Blanc ; Senegal coast ; Mossamides ; Mediterranean ; West coasts Europe ; Canaries ; **Seas of the Cape** ; Gorca).

*Pagellus cariariensis*, Valenc. Ichth. Canar. p. 35, pl. 10, fig. 2, 1843 (Canary Islds).

### **Pagellus fascialis**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 28, 1861 (**Algoa Bay**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 115 (**S. Africa**).

### **Pagellus lithognathus**, Cuv. & Val.

(*White steenbras*, of the Cape ; *River Steenbras*, of Natal).

*Pagellus lithognathus*, Cuv. & Val. vi, p. 204, pl. 151, 1830 (**Cape of Good Hope**) ; Günth. Cat. Fish. i, p. 483, 1859 (**Cape of Good Hope** ; **Cape Seas**) ; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 52, name only, (**Cape Seas**) ; Casteln. Mem. Poiss. Afr. Austr. p. 26, 1861 (*Steenbrasen*. South and East coasts of **South Africa** ; **Algoa Bay** ; Port Natal ; taken with a hook at **Simon's Bay** ; young caught in winter, June and July) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 115 (**S. Africa**) ; Regan, Col. Fish in Ann. Natal Gov. Mus. 1, pt. 3, 1908, p. 245 (**Bird Istd.**) ; Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 233 (Natal).

*Lithognathus capensis*, Swainson, Nat. Hist., Fishes ii, p. 222, 1839 ; Pappe, Synops. Edib. Fish. C. G. Hope, p. 20, 1853, and 2nd ed. p. 14, 1866 (*Blaauw Kaapsche Steenbrasen* ; caught during summer, especially in **Hout Bay**).

**Pagellus mormyrus**, Linn.

(Zee Basje).

*Móρμορος*, Aristotle, Hist. an. vi, cap. 17; Athen. Deipnos. vii, p. 313, A.D. 150.

*Μορμυλος* αὐλος, Oppian, i, v, p. 100, A.D. 200.

*Mormyrus*, Pliny, xxxii, cap. 11; Bellon. Aquat. p. 183, 1551; Rondel. De Pisc., v, cap. 22, p. 153, 1554 (Rome); Salvian. Aquat. f. 184, 1554; Gesner, Hist. Anim. p. 547, 1558; Aldrov. De Pisc. ii, cap. 19, p. 184, 1638; Willughby, Ichthyog. p. 329, 1686; Ray, Synops. p. 134, 1713.

*Sparus* no. 9, Artedi, genera Pisc. p. 37, 1738.

*Sparus mormyrus*, Linn. Syst. Nat. ed. x, p. 281, 1758, and ed. xii, p. 472, 1766; Brunn. Pisc. Massil. p. 96, 1768 (Adriatic); Gmel. Linn. Syst. Nat. p. 1279, 1793; Bl. Schn. Syst. Ichth. p. 277, 1801; Lacép. Hist. Nat. Poiss. iv, p. 109, 1802 (Mediterranean); Martens, Reise n. Venedig ii, p. 425 (Venice).

*Pagrus mormyrus*, Geoff. Descr. Egypte, Poiss. pl. 18, fig. 3, 1813.

*Pagellus mormyrus*, Cuv. & Val. vi, p. 200, 1830 (Mediterranean); Webb & Berth. Hist. Nat. Iles Canaries, Poiss. p. 35, 1836; Guichen. Explor. Sc. Algér. Poiss. p. 51, 1850; Günth. Cat. Fish. i, p. 481, 1859 (Sicily; Malta; Dalmatia; Mediterranean; Lanzarole; Canary Islds; St. Vincent; North-west coast Africa; ? **Cape of Good Hope**; Atlantic coasts of tropical America); Jord. & Fesler, Sparoid Fish. Amer. and Europe, in Rept. Comm. Fish and Fisheries, 1889-1891 (1893), p. 517 (Mediterranean Sea & neighbouring coasts; ascribed on very doubtful authority to America); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 115 (**S. Africa**); Regan, Col. Fish. in Ann. Natal Gov. Mus. i, pt. 3, 1908, p. 245 (Kosi Bay); Pellegr. Ann. Inst. Oceanogr. Poiss. tome vi, fasc. iv, 1914, p. 54 (Cap Blanc; Praya-Amelia, Angola; Mediterranean; intertropical Atlantic to America).

*Pagellus goreensis*, Cuv. & Val. vi, p. 203, 1830 (Gorea).

*Pagellus pernambucensis*, Cuv. & Val. vi, p. 213, 1830 (Pernambuco).

**Chrysophrys**, Cuv.

*Chrysophrys*, Cuv. Règne Anim. ed ii, 1829; Cuv. & Val. Hist. Nat. Poiss. vi, p. 81, 1830; Günth. Cat. Fish. i, p. 483, 1859.

*Chrysoblephus*, Swainson, Nat. Hist., Fishes 11, p. 221, 1839.

**Chrysophrys algoensis**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 22, 1861 (**Algoa Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 113 (**S. Africa**).

**Chrysophrys cristiceps**, Cuv. & Val.

(Roman).

Cuv. & Val. vi, p. 132, 1830 (**Cape of Good Hope**) ; Pappe, Synops. Edib. Fish. C. G. Hope, p. 19, no. 14, 1853, and 2nd ed. p. 13, 1866 (*Roman*. Common in the waters east of **Table Bay** and especially near the **Roman Rock**) ; Günth. Cat. Fish. i, p. 486, 1859 (**Cape Seas**) ; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 62, (**Cape of Good Hope**) ; Casteln. Mém. Poiss. Afr. Austr. p. 22, 1861 (*Roman-fish* ; principally found in **Simons Bay**, near the **Roman Rock** ; one or two individuals only observed in Table Bay, it may be said that its range does not pass the Cape of Good Hope westwards) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 112 (**S. Africa**).

**Chrysophrys gibbiceps**, Cuv. & Val.

(Red Stumpnose.)

*Chrysophrys gibbiceps*, Cuv. & Val. vi, p. 127, 1830 (**Cape of Good Hope**) ; Günth. Cat. Fish. i, p. 486, 1859 (**False Bay** ; **Cape Seas**) ; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 62 (*Baaische Roode Stompeus* ; **Cape Seas**) ; Casteln. Mém. Poiss. Afr. Austr. p. 20, 1861 (*Roode Stumpnose* ; not found in **Table Bay**, but frequently caught during the hot weather in **Simons Bay**) ; Kner, *Novara*, Fische, p. 86, 1865 (**Cape**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 112 (**S. Africa**) ; Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 245 (**Bird Isld.**).

*Chrysoblephus gibbiceps*, Swainson, Nat. Hist., Fishes, ii, pp. 171 and 221, 1839 ; Pappe, Synops. Edib. Fish. C. G. Hope, p. 19, no. 15, 1853, and 2nd ed. p. 14, 1866 (*Baaische Roode Stompeus* ; *Poeskop*). Rare in **Table Bay**, but frequently caught with the hook in **False Bay**, **Mosterd Bay**, **Fishhoek**, and similar localities).

**Chrysophrys globiceps**, Cuv. & Val.

(White Stumpnose.)

*Sparus auratus*, Bl. Ausl. Fische, taf. 266, 1795.

*Chrysophrys globiceps*, Cuv. & Val. vi, p. 100, 1830 (**Cape of Good Hope**) ; Pappe, Synops. Edib. Fish. C. G. Hope, p. 18, no. 12, 1853, and 2nd ed. p. 13, 1866 (*Stompeus*). Caught in great abundance during the summer at the **Cape**) ; Günth. Cat. Fish. i, p. 485, 1859 (**Cape of Good Hope**) ; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 62 (*Stompeus*. **Cape Seas**) ; Casteln. Mém. Poiss. Afr. Austr. p. 23, 1861 (*Stompeus*). Common

on the **Cape market**, especially in summer; taken in large quantities at **Kalk Bay** in January); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 111 (**S. Africa**).

### **Chrysophrys (Pagrus) laticeps**, Cuv. & Val.

(Dageraad.)

*Cynædus* sp., Gronov. Zoophyl., no. 213, 1763.

*Chrysophrys laticeps*, Cuv. & Val. vi, p. 122, 1830 (**Cape of Good Hope**); Cuv. Règne Anim. Ill. Poiss. pl. 34, fig. 2, 1850; Günth. Cat. Fish. i, p. 485, 1859 (**Cape Seas**).

*Pagrus laniarius*, Pappe, Synops. Edib. Fish. C. G. Hope, p. 20, no. 16, 1853, and 2nd ed. p. 14, 1866 (Dageraad). Not found in **Table Bay**, but frequently caught with the hook in the waters towards the east and south of Cape Town); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 52, name only (**Cape Seas**).

*Perca leonina*, Gronov. Syst. ed. Gray, p. 113, 1854 (**Cape of Good Hope**).

*Chrysophrys laniarius*, Casteln. Mém. Poiss. Afr. Austr. p. 21, 1861 (Dageraad). Common on the east coast of the **Southern point of Africa**, but does not pass the Cape of Good Hope, and not found in Table Bay. Found in **Algoa Bay**; **Simon's Bay**; **Kalk Bay**; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 112 (**S. Africa**).

*Pagrus (Pagrus) laticeps*, Steindr. Ichth. Beitr. x, 1881, p. 27 (**Cape of Good Hope**; Zanzibar; Mauritius).

*Pagrus laticeps*, Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 114 (**S. Africa**), not synon.

*Chrysophrys (Pagrus) laticeps*, Gilchr. Mar. Biol. Rept. ii, 1914, p. 101 (**False Bay**; abundant a few miles further eastwards and on the East coast to Natal).

### **Chrysophrys vagus**, Peters.

*Chrysophrys vagus*, Peters, Mon. Berl. Acad. 1852, p. 681, and Reise n. Mossamb. iv, p. 11, pl. ii, fig. 1, 1868.

*Sparus vagus*, Bouleng. Freshw. Fish. Afr. iv, p. 132, 1915 (**Lower Zambesi** and Licuara Rivers).

### **Charax**, Risso.

Risso, Eur. Mérid. iii, p. 353, 1827; Cuv. & Val. Hist. Nat. Poiss. vi, pp. 9 and 71, 1830; Günth. Cat. Fish. i, p. 452, 1859.

### **Charax capensis**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 19, 1861 (**Cape of Good Hope**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 117 (**S. Africa**).

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**Gymnocrataphus**, Günth.

Günther, Cat. Fish. i, p. 432, 1859.

**Gymnocrataphus curvidens**, Günth.

(John Brown.)

Günther. Cat. Fish. i, p. 432, 1859 (**Cape Seas**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 116 (**S. Africa**).**Boopsoidea**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 25, 1861.

**Boopsoidea inornata**, Cast.Casteln. Mém. Afr. Austr. p. 26, 1861 (*French Madam*, **Kalk Bay**; **Algoa Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 117 (**S. Africa**).**Pagrichthys**, Blkr.

Bleeker, Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 60.

**Pagrichthys castelnaui**, Blkr.Bleeker, Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860 p. 61 (**Cape Seas**).

## FAMILY SCORPIDIDAE.

**Atyposoma**, Blgr.

Bouleng. Ann. S. Afr. Mus. i, pt. 2, 1899, p. 379.

**Atyposoma gurneyi**, Blgr.Bouleng. Ann. S. Afr. Mus. i, pt. 2, 1899, p. 379, pl. ix (**False Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 106 (**False Bay**).**Psettos**, Cuv. & Val.*Monadactylus* (non Klein), Lacép. Hist. Nat. Poiss. iii, p. 131, 1802; Jord. & Seale, Fish. Samoa, in Bull. Bureau Fish. U. S. Amer. xxv, 1905, p. 236 (1906).*Centropodus*, Lacép. t.c.p. 303, 1802.*Acanthopodus*, Lacép. Hist. Nat. Poiss. iv, p. 558, 1802.*Psettos* (Commers.), Cuv. & Val. Hist. Nat. Poiss. vii, p. 240, 1831; Günth. Cat. Fish. ii, p. 486, 1860; Klunz. Verh. Zool.-bot. Ges. Wien, xx, 1870, p. 793; Bouleng. Freshw. Fish. Afr. iii, p. 119, 1915.*Stromatoidea*, Casteln. Mém. Poiss. Afr. Austr. p. 44, 1861.

**Psettus argenteus**, Linn.

*Chaetodon argenteus*, Linn. Syst. Nat. ed. x, 1758 (China) after Lagerstrom, and ed. xii, i, p. 461, 1766, and Amoen. Acad. iv, p. 249, 1759; Bl. Schn. Syst. Ichth. p. 230, 1801.

*Scomber rhombeus*. Forsk. Descr. Anim. p. 58, 1775 (Red Sea); Shaw, Gen. Zool. iv, p. 595, 1803.

*Centrogaster rhombeus*, Gmel. Linn. Syst. Nat. p. 1338, 1788.

*Centropodus rhombeus*, Lacép. Hist. Nat. Poiss. iii, pp. 303 & 304, 1802 (Red Sea).

*Acanthopodus argenteus*, Lacép. t.c. iv, pp. 558 & 559, 1802 (Indian Ocean).

*Zeus kanki-sandawa*, Russell, Fish. Vizagapatam, i, p. 47, pl. 59, 1803.

*Psettus rhombeus*, Cuv. & Val. vii, p. 245, 1831 (Vizagapatam; Pondicherry; Isle de France; Red Sea); Val. & Cuv. Règne Anim. Ill. Poiss. pl. xlvi, fig. 2, 1836; Blkr. Verh. Bat. Gen. xxiii, 1850, Chaetod. p. 29 (Sunda-Molucca Archipelago); Peters, Wieg. Arch. 1855, p. 247.

*Monodactylus rhombeus*, Griffith in Cuv. Anim. Kingd., Fish. pl. 55, fig. 2, 1834; Swainson, Nat. Hist., Fishes, ii, p. 212, 1839; Cantor, Malayan Fish. p. 172, 1849.

*Psettus argenteus*, Richards. Voy. *Erebus & Terror*, Fish. p. 57, pl. 35, figs. 1-3, 1846; Günth. Cat. Fish. ii, p. 487, 1860 (Red Sea; through all Indian seas to coasts of Australia and Polynesia), Fische, Südsee, p. 140, 1876 (Samoa), and Challenger, Shore Fishes, p. 35, name only, 1880 (Levuka, Fiji Islds.); Kner, *Novara*, Fische, p. 164, 1865; Day, Fish. Malabar, p. 99, 1865, and Fish. India, p. 235, pl. li, fig. 5, 1876 (Madras; common in Malabar during monsoon months); Playfr. Fish. Zanz. p. 64, 1866 (Aden; Zanzibar); Klunz. Verh. Zool.-bot. Ges. Wien, xx, 1870, p. 794 (Red Sea), and Fische Roth. Meer. p. 117, 1884 (part); Douglas Ogilby, Edib. Fish. N.S. Wales, p. 91, 1893; M. Web. Zool. Jahrb. Bd. x, 1897, p. 142 (**Cape, Knysna**; Natal, Illovo River); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902 (**S. Africa**); Steindr. Fish. Süd-arab and Sokotra, p. 22, 1902 (Tamarida, Sokotra); Regan, Trans. Linn. Soc. xii, pt. 3, 1908, p. 254 (Mangrove swamp, Praslin; and lagoon Silhouette, Seychelles); Bouleng, Freshw. Fish. Afr. iii, p. 123, 1915 (Zanzibar; mouth of **Zambesi**; Rodriguez, freshwater).

*Monodactylus argenteus*, Blkr. Poiss. Madag. & Reunion, 1875; ? Jord. & Seale, Fish. Samoa, p. 237, 1906 (Samoa; New Guinea; Vanicolo; Fiji; East Indies; Australia), and Fish Luzon and Panay, p. 32, 1907 (Cavite); Everm. & Seale, Fish. Philipine Islds. p. 71, 1907 (Bulan); Jord. & Rich. Fish. Philipine Archip. p. 269, 1908 (Aparri; Ilo Ilo; Calayan).

**Psettus falciformis**, Lacép.

*Monodactylus falciformis*, Lacép. Hist. Nat. Poiss. ii, pl. v, fig. 4, 1801, and iii, p. 132, 1802 (No locality stated).

*Psettus commersonii*, Cuv. & Val. vii, p. 250, 1831 (Vanicolo), after Lacépède.

*Psettus falciformis*, Günth. Cat. Fish. ii, p. 488, 1860 (Red Sea ; Sea of Vanicolo ; Chinese Sea) ; Day, Fish. Malabar, p. 100, 1865 ; and Fish. India, p. 234, pl. lia, fig. 6, 1875 (Red Sea ; Madras ; Seas of India and beyond) ; Sauvage, Hist. Madagascar, Poiss. p. 334, 1891 ; M. Web. Zool. Jahrb. Bd. x, heft 2, p. 142, 1897 (Illovo River, Natal, several hours journey from the sea) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 127 (**S. Africa**) ; Regan, Col. Fish. in Ann. Natal Gov. Mus. i, pt. 3, 1908, p. 245 (Kosi Bay) ; Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 245 (Natal) ; Bouleng. Freshw. Fish. Afr. iii, p. 120, 1915 (Red Sea ; Mombasa ; Durban ; Illovo River near Durban, in fresh water) ; **Algoa Bay** ; **Chalumna River** near King William's Town, 12 miles from the sea).

*Stromatoidea layardi*, Casteln. Mém. Poiss. Afr. Austr. p. 44, 1861 (**Algoa Bay** ; Natal) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 129 (**S. Africa**).

*Psettus orbicularis*, Guichen, Mém. Soc. Sci. Cherbourg, xii, 1866, p. 136.

*Psettus argenteus* (part.), Klunz. Fische Roth. Meer. p. 117, 1884.

## FAMILY LABRIDAE.

**Xyrichthys**, Cuv.

*Xyrichthys*, Cuv. Mém. du Mus. d'Hist. Nat. i, pp. 324 and 329, 1815 ; Cuv. & Val. Hist. Nat. Poiss. xiv, p. 33, 1839 ; Jord. & Everm. Fish. N. and Mid. Amer. p. 1617, 1898.

*Novacula*, Cuv. Règne Anim. ed. i, p. 265, 1817 ; Cuv. & Val. t.c.p. 64, 1839 ; Bleeker, Proc. Zool. Soc. 1861, p. 414 ; Günth. Cat. Fish. iv, p. 168, 1862.

*Amorphocephalus*, Bowditch, Excurs. Madeira, p. 238, 1825.

*Novacula* sp., Steindr. Verh. Zool-bot. Ges. Wien, 1861, p. 133.

**Xyrichthys argenteimaculata**, Steindr.

*Xyrichthys argenteimaculata*, Steindr. Zool.-bot. Ges. Wien, 1861, p. 134.

*Novacula argenteimaculata*, Günth. Cat. Fish. iv, p. 170, 1862 (**Cape of Good Hope** ; Brazil) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 139 (**S. Africa**).

**Xyrichthys novacula**, Linn.

*Novacula*, Pliny, Hist. mundi, xxxii, cap. 2 ; Gesner, Hist. pp. 628, 629 and 721, 1558, and Paralip. p. 24 ; Rondel, Aquat. v, cap 17, p. 146, 1560 ; Willughby, Ichthyog. p. 214, pl. O2, 1685 ; Ray, Synops. p. 101, 1713.

*Pesce pettine*, Salvian. Aquat. p. 217, 1554.  
*Pecten romae*, Aldrov. De Pisc. ii, cap. 27, p. 205, 1638; Jonston, Hist. Nat. de Pisc. i, tit. 3, cap. 1, art. 15, 1649.  
*Coryphaena pulmaris pulchre varia, dorso acuto*, Artedi, Gen. Pisc. p. 15, Synon. p. 29, 1738.  
*Coryphaena novacula*, Linn. Syst. Nat. ed. x, p. 262, 1758, after Artedi; Bl. Schn. Syst. Ichth. p. 295, 1801; Lacép. Hist. Nat. Poiss. iii, p. 203 (Mediterranean); Shaw, Gen. Zool. iv, p. 217, 1804; Risso, Ichth. Nice (not Eur. Mérid.) p. 181, 1810.  
*Coryphaena lineolata*, Rafinesque, Caratteri, p. 33, 1810 (Palermo).  
*Amorphocephalus granulatus*, Bowditch, Excur. Madeira, p. 238, 1825 (Bona Vista).  
*Xyrichtys cultratus*, Cuv. & Val. xiv, p. 37, pl. 391, 1839 (Martiques; Montpellier; Ivica; Seide).  
*Xyrichtys novacula*, Cuv. Règne anim. Ill. Poiss. pl. 89, fil. 3, 1850; Jordan, Rev. Labroid Fish. in Rept. Comm. U.S. Fish & Fisheries xv, 1887 (1891), p. 660, 1890 (Mediterranean and West Indian fauna, north to Pensacola and Charlestown).  
*Novacula cultrata*, Günth. Cat. Fish. iv, p. 169, 1862 (**South Africa**; Mediterranean; Bay of Naples; Madeira; Lanzarote; Caribbean Sea; Bahia); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 139 (**S. Africa**); Pellegr. Ann. Inst. Oceanogr. Poiss. tome vi, fasc. iv, 1914, p. 64 (Coasts of Mauritius and Senegal).

**Thalassoma**, Swainson.

*Thalassoma*, Swainson, Hist. Nat. Classfn. Fishes, ii, p. 224, 1839; Jord. & Everm. Fish. N. and Mid. Amer. p. 2859, 1898.  
*Chlorichthys*, Swainson, t.c.p. 232, 1839; Jordan, Rev. Labroid Fish. in Rept. Comm. Fish. & Fisheries U.S.A., xv, 1887, (1891), p. 651.  
*Julis*, Günth. Cat. Fish. iv, p. 179, 1862 (not of Cuv., Règne Anim. 1817, p. 261).

**Thalassoma guntheri**, Blkr.

*Julis quadricolor*, Blkr. Act. Soc. Sc. Indo-Nederl. i, 1856, p. 55 (Manado), not Nat. Tijds. Nederl. Ind. xix, 1859, p. 339.  
*Julis guntheri*, Blkr. Versl. Akad. Wet. Amst. xiii, 1862, p. 279 (Indian Archipelago), and Atlas Ichth. p. 94, tab. 34, fig. 1, 1862; Günth. Cat. Fish. iv, p. 189, 1862 (**Cape of Good Hope**; Celebes); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 140 (**S. Africa**).  
*Thalassoma guntheri*, Streets, Bull. U.S. Nat. Mus. vii, 1877, p. 83 (Fanning Isld.); Jord. & Seale, Fish. Samoa, p. 305, 1906 (Apia); Jord. & Rich. Fish. Philipine Archip. p. 267, 1908 (Calayan Isld.).

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**Thalassoma purpureum**, Forsk.

(Parrot-fish, of Natal.)

*Scarus purpureus*, Forsk. Descr. anim. p. 27, 1775 (Red Sea), not *Julis purpurea* of Rüppell or Günther.

*Scarus georgii*, Bennett, Fish. Ceylon, p. 24, 1830 (Ceylon).

*Scarus semicoeruleus*, Rüpp. N.W. Fische, p. 10, pl. 3, fig. 1, 1835 (Red Sea); Cuv. & Val. xiii, p. 442, 1839.

*Julis quadricolor*, Lesson, Voy. *Coquille*, ii, p. 139, pl. 35, fig. 1, 1838 (Tahiti); Cuv. & Val. xiii, p. 443, 1839 (Tahiti); Blkr. Atlas Ichth. Labr. p. 93, 1862 (Java), not the plate, which is *Thalassoma fuscum*.

*Julis erythrogaster*, Cuv. & Val. xiii, p. 447, 1839 (Ulea; Tahiti).

*Scarus quinquevittatus*, Richards. Voy. *Blossom*, p. 66, pl. 19, fig. 3, 1839.

*Julis trilobata*, Günth. (part.) Cat. Fish. iv, p. 187, 1862 (**South Africa**; Mauritius; Aneiteum); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 140 (**S. Africa**); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 199 (Natal).

*Julis purpurea* (part.), Day, Fish. India, p. 404, pl. lxxxvi, fig. 3, 1877 (Red Sea; East coast of Africa; Andamans; seas of India to Malay Archipelago, China and beyond).

*Thalassoma immanis*, Fowler, Proc. Ac. Nat. Sc. Philad. 1899, p. 488, pl. 18, fig. 2 (Caroline Islds.).

*Julis ruppellii*, Steindr. Denks. Ak. Wiss. Wien, 1900, p. 506 (Laysan), not of Klunz.

*Thalassoma purpureum*, Seale, Occ. pap. Bishop Mus. 1901, p. 91 (Guam); Jord. & Seale, Fish. Samoa, p. 305, 1906 (Hawaii; Samoa; Tahiti; Guam; Caroline Islds.; Aneiteum; Laysan; Thornton Isld.; East Indies).

*Thalassoma berndti* (misprinted *berendti*), Seale, t.c.p. 115, fig. 7 (Honolulu).

*Thalassoma quadricolor*, Jenkins, Bull. U.S. Fish. Comm. xxii, 1902 (1903), p. 462 (Honolulu); Jord. & Everm. Fish. Hawaiian Islds. in Bull. U.S. Fish. Comm. xxiii, pt. 1, 1903 (1905), p. 295 (Honolulu; Hilo; Kilua; not rare in Samoa).

## DIVISION SCOMBRIFORMES.

## FAMILY CARANGIDAE.

**Trachurus**, Rafinesque.*Trachurus* sp., Linn. Syst. Nat. ed. x, p. 298, 1758.

*Trachurus*, Rafinesque, Ind. d'Ittiol. Siciliana, p. 20, 1810, and Caratteri di alcuni nuovi generi p. 41, 1810; Cuv. Règne Anim. ed. i, 1817; Cuv. & Val. Hist. Nat. Poiss. ix, p. 6, 1833; Günth. Cat. Fish. ii, p. 419, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 909, 1896; Delfin. Pecces, Chile, p. 53, 1901.

**Trachurus trachurus**, Linn.

(Maasbanker.)

*Τραχύρος*, Athen. Deipnos. vii, p. 326, A.D. 150; Oppian, Halient. i, p. 5, A.D. 200.

*Saurus*, Salyian. Aquat. fo. 79, 1554.

*Lacertus s. trachurus*, Bellon. De Aquat. p. 133, 1553; Gesner, Hist. pp. 467 and 552, 1558.

*Trachurus*, Rondel. Aquat. vii, cap. 6, p. 233, 1560; Schonev. Ichth. p. 75, 1624; Aldrov. De Pisc. ii, cap. 52, p. 268, 1638; Jonston, De Pisc. i, tit. 3, cap. 3, art. 1, tab. 21, fig. 8, 1649; Willughby, Hist. Pisc. p. 290, tab. S. 22, 1686; Ray, Synops. p. 92, 1713.

*Scomber* No. 3, Artedi, Gen. Pisc. p. 31, 1738.

*Scomber* sp., Gronov. Mus. Ichth. i, p. 34, no. 80, 1756, and Zoophyl. no. 308, 1763; Pennant, Brit. Zool. iii, p. 237, pl. 51, 1769; Duhamel, Peches, ii, sect. 7, p. 189, 1777.

*Scomber trachurus*, Linn. Syst. Nat. ed. x, p. 298, 1758 (Mediterranean Sea); Bl. Ichth. taf. 56, 1797; Bl. Schn. Syst. Ichthy. p. 27, 1801; Donovan, British Fish. i, pl. 3, 1808; Pallas. Zoogr. Russ. iii, p. 218, 1811.

*Trachurus trachurus*, Bl. Ichth. ii, p. 138, pl. 36, 1784; Casteln. Anim. nouv. ou rares, p. 23, 1855; Günth. Cat. Fish. ii, p. 419, 1860 (British coasts; Mediterranean; Southern Europe; Sicily; Dalmatia; Lisbon; Madeira; **Cape of Good Hope**; Australia; New Zealand), and Challenger, Shore Fishes, pp. 24, 66, name only, 1880 (Valparaiso; market at Yokohama); Steindr. Ichth. Bericht. v, p. 32, 1868, and Fische, Süd-arab. and Sokotra, p. 20, 1902 (Gischin); Berg. An. Mus. Nac. Buenos-Aires, iv, p. 35, 1875; Lutken, Spolia Atlantica, p. 125, 1880; Jord. & Gilbert, Proc. U.S. Nat. Mus. 1882, p. 269; Jord. & Everm. Fish. N. and Mid. Amer. p. 910, 1896 (North Atlantic, chiefly on the coasts of Europe, South to Spain and Naples; very rare on American coast, recorded from Newport, R.I.; Pensacola; Cape San Lucas); Jord. & Snyder, List. Jap. Fish. in Proc. U.S. Nat. Mus. xxiii, 1901, p. 748 (Yokahama, abundant); Delfin, Cat. Peces, Chile, p. 53, 1901 (Abundant everywhere); Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 246 (**Bird Isld.**); Seale, Fish. Hongkong, p. 62, 1914 (Hongkong).

*Caranx trachurus*, Lacép. Hist. Nat. Poiss. iii, p. 63, 1802 (Mediterranean; Atlantic and Pacific Oceans); Risso, Ichth. Nice, p. 173, 1810, and Eur. Mérid. iii, p. 421, 1827; Cuv. & Val. ix, p. ii, pl. 246, 1833 (Mediterranean; Teneriffe; **Cape of Good Hope**; Indian Seas); Parnell, Fish. Firth of Forth, p. 57, 1838; Nordm. in Demid. Voy. Russ. Mérid. iii, p. 393, 1840; Yarrell, British Fish. i, p. 175, 1841; Richards. Ann. and Mag. Nat.

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Hist. 1843, xi, p. 25, and Ichth. China, p. 273, 1846; Gay, Hist. Chile, Zool. ii, p. 230, 1848; Cuv. Règne Anim. Ill. Poiss. pl. 57, fig. 1, 1850; Guichen. Explor. Algérie, Poiss. p. 61, 1850; Pappe, Synops. Edib. Fish. C. G. Hope, p. 25, 1853, and 2nd ed. p. 18, 1866 (*Maasbunker*; *Bastard Mackerel*. **Cape Seas**); Day, British Fish. i, p. 124, pl. xliv, 1884; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 125 (**S. Africa**); Herdm. & Daw, Fish. Irish Sea, in Mém. Lancashire Sea-Fisheries, no. ii, 1902, p. 38 (British coasts); Waite, List Fish. New Zealand, in Rec. Cant. Mus. i, no. 1, 1907, p. 23.

*Caranxomorus plumerianus*, Lacép. t.c. pl. 11, fig. 1, according to Cuvier (no locality stated).

*Caranx amia*, Risso, Ichth. Nice, p. 174, 1810.

*Trachurus saurus*, Rafinesque, Ind. d'Ittiol. Siciliana, p. 20, 1810; Jord. & Gilb. Synops. p. 911, 1883, and Proc. U.S. Nat. Mus. 1883, p. 191.

*Seriola picturata*, Bowditch, Excurs. Madeira, p. 123, fig. 27, 1825 (Madeira).

*Caranx semispinosus*, Nilsson, Prodr. Ichth. Scand. p. 84, 1832 (Scandinavia).

*Caranx cuvieri*, Lowe, Trans. Zool. Soc. ii, 1835-1841, p. 183.

*Caranx declivis*, Jenyns, Zool. Beagle, Fish. iii, p. 68, pl. 14, 1842.

*Caranx trachurus japonicus*, Schleg. Fauna Japon. Poiss. p. 109, pl. 59, fig. 1, 1844 (Nagasaki).

*Selar japonicus*, Blkr. Verh. Bat. Gen. xxv, 1853, p. 35 (Japan), and xxvi, 1854-1857, pl. 8, fig. 1 (Japan).

*Trachurus europeus*, Gronov. Syst. ed. Gray, p. 125, 1854 (European Seas).

*Caranx symmetricus*, Ayres, Proc. Calif. Acad. Nat. Sc. i, 1855, p. 62 (San Francisco).

*Trachurus symmetricus*, Girard, U.S. Pacific R.R. Exped. Fish., p. 107, 1858.

*Selar trachurus*, Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, pp. 53 and 67 (**Cape Seas**).

*Trachurus capensis*, Casteln. Mém. Poiss. Afr. Austr. p. 43, 1861 (*Bastard Mackerel*, *Maasbunker*, **Cape Seas**).

*Trachurus linnaei*, Malm, Bohusläns Fauna, p. 421, 1877 (Sweden).

*Trachurus japonicus*, Jord. Tan. & Snyd. Cat. Fish. Japan, p. 128, 1913 (Seas of Japan).

### *Selene*, Lacép.

*Selene*, Lacép. Hist. Nat. Poiss. iv, 560, 1802; Jord. & Everm. Fish. N. and Mid. Amer. p. 935, 1896.

*Argyreiosus*, Lacép. t.c.p. 566; Günth. Cat. Fish. ii, p. 457, 1860.

*Argyreiosus et Vomer*, Cuv. & Val. Hist. Nat. Poiss. ix, pp. 177 and 189, 1833.

**Selene gibbiceps**, Gilchr.Gilchr., Mar. Biol. Rept. ii, 1914, p. 128 (**Walfish Bay**).**Seriola**, Cuv.

*Seriola*, Cuv. Règne Anim. ed. 2, ii, p. 218, 1829; Cuv. & Val. Hist. Nat. Poiss. ix, p. 200, 1833; Günth. Cat. Fish. ii, p. 462, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 901, 1896.

*Micropteryx*, Agassiz, Pisc. Brazil, p. 104, taf. lix, 1829 (substitute for *Seriola*, used in botany; not *Micropteryx*, Hubner, 1816, a genus of insects).

*Zonichthys*, Swainson, Nat. Hist. Classfn. Fishes, ii, p. 248, 1839.

*Halatractus*, Gill, Proc. Ac. Nat. Sc. Philad. 1862, p. 442 (substitute for *Seriola*).

*Lepidomegas*, Thominot, Bull. Sc. Philom. Paris, 1866, iv, p. 173.

**Seriola lalandii**, Cuv. & Val.

(Yellow-tail; Geel-staart; Albacore; Amber-Jack).

*Seriola lalandii*, Cuv. & Val. ix, p. 208, 1833 (Brazil); Günth. Cat. Fish. ii, p. 463, 1860 (**Cape Seas**; St. Helena); Steindr. Ichth. Berich. v, p. 40, 1868; Goode & Bean, U. S. Fish Comm. i, 1881, p. 43; Jord. & Gilbert, Proc. U. S. Nat. Mus. 1882, p. 271; Jord. Proc. U. S. Nat. Mus. 1884, pp. 122, 123; McCoy, Prodr. Zool. Vict. Dec. xviii, 1889, pl. clxxii; Jord. & Everm. Fish. N. and Mid. Amer. p. 903, 1896 (West Florida to Brazil, rather common; occasionally north to New Jersey); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 125 (**S. Africa**).

*Seriola aureo-vittata*, Schleg. Fauna Japon. Poiss. p. 115, pl. 62, fig. 1, 1845 (Japan).

*Scomber capensis*, Pappe, Synops. Edib. Fish. C. G. Hope, p. 23, no. 26, 1853, and p. 16, 1866 (*Halfcord*; rather uncommon in **Table Bay**).

*Seriola capensis*, Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, pp. 53 and 65, (*Halfcord*; **Simons Bay**).

*Seriola gigas*, Poey, Mém. Hist. Nat. Cuba, ii, p. 227, 1860 (Cuba).

*Lichia pappei*, Casteln. Mém. Poiss. Afr. Austr. p. 40, 1861 (*Halfcord*; found in great numbers during the summer at **Kalk Bay**).

*Zonichthys gigas*, Poey, Synops. Pisc. Cubensium, p. 371, 1868.

**Naucrates**, Rafinesque.

*Centronotus*, Lacép. Hist. Nat. Poiss. iii, p. 311, 1802 (not *Centronotus* of Bl. & Schn. 1801, which is *Pholis*).

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*Naucrates*, Rafinesque, Caratteri d'alc. nuovi Gen. p. 44, 1810, and in Cuv. Règne Anim. 1817; Cuv. & Val. Hist. Nat. Poiss. viii, p. 312, 1831; Günth. Cat. Fish. ii, p. 374, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 900, 1896.

*Pomphilus*, Minding, Lehrb. Nat. Fische, p. 108, 1832.

*Nauclerus*, Cuv. & Val. Hist. Nat. Poiss. ix, p. 247, 1833.

*Xystophorus*, Richards. Voy. *Erebus & Terror*, Fish. p. 52, 1844.

**Naucrates ductor**, Linn.

(*Pilot-fish*).

*Πόμπιλος*, Aelian, De Anim. Nat. ii, cap. 15, xv cap. 23, A.D. 120; Athen. Deipnos. vii, p. 282, A.D. 150; Oppian, Halieut. i, p. 188, A.D. 200.

*Pomphilus*, Ovid, Hal. v, p. 101; Pliny, Hist. Nat. ix, cap. 15, xxxii cap. 11; Gesner, Hist. p. 881, 1558; Aldrov. De Pisc. iii, cap. 19, p. 325, 1638; Willughby, Hist. Pisc. p. 215, 1686 and App. pl. 8, fig. 2; Ray, Synops. p. 101, 1713 (not Rondel).

*Pilote*, Dutertre, Hist. Antilles, ii, p. 223, 1667 (Antilles).

*Coryphaena no. 3*, Artedi, Gen. Pisc. p. 16, 1738.

*Gasterosteus ductor*, Linn. Syst. Nat. ed. x, p. 295, 1758 ("in Pelago"); Brunn. Pisc. Massil. p. 67, 1768 (Marseilles; rare); Bennet, Whaling Voy. ii, p. 274, 1840.

*Scomber* sp., Gronov. Zoophyl. no. 309, 1763; Koelreuter, Nov. Comm. Petrop. ix, p. 464, t. 10, figs. 4 and 5.

*Scomber ductor*, Hasselq. Iter. Palestinum, p. 336, 1757; Bl. Ichth. t. 338, 1797; Bl. Schn. Syst. Ichth. p. 32, 1801; Mitchell, Trans. Lit. & Phil. Soc. New York, i, p. 424, 1815.

*Gasterosteus antecessor*, Daldorf, Skript. Na. Selsk. Kjöbenh. ii, p. 166, 1800 (Atlantic Ocean).

*Scomber Koelreuteri*, Bl. Schn. Syst. Ichth. p. 570, 1801.

*Centronotus conductor*, Lacép. Hist. Nat. Poiss. iii, p. 311, 1802 (No locality stated); Risso, Ichth. Nice, p. 428, 1810, and Eur. Mérid. iii, p. 193, 1827; Couch, Trans. Linn. Soc. xiv, p. 82.

*Naucrates fanfarus*, Rafinesque, Caratteri, p. 45, 1810 (Sicily).

*Naucrates indicus*, Lesson, Voy. *Coquille*, p. 157, 1829 (India); Cuv. & Val. viii, p. 326, 1831 (Malabar; Amboina); Richards. Ichth. China, p. 269, 1846; Cuv. Règne Anim. Ill. Poiss. pl. 54, fig. 1, 1850.

*Naucrates ductor*, Cuv. & Val. viii, p. 312, pl. 232, 1831 (Mediterranean; Atlantic Ocean; Indies; America; Antilles); Yarrell, British Fish. i, p. 170, 1841; Guichen. Explor. Algérie, Poiss. p. 60, 1850; Günth. Cat. Fish. ii, p. 374, 1860 (**Cape Seas**; N. W. coast America; Devon; Cornwall; Madeira; South Pacific); Playf. Fish. Zanz. p. 63, 1866 (East coast Africa); Klunz. Verh. zool.-bot.

Ges. Wien, 1871, p. 445; Day, Fish. India, p. 229, pl. li, fig. 2, 1876 (Indian Ocean); Gill, Proc. U. S. Nat. Mus. 1882, p. 490; Jord. & Gilbert, Synops. p. 443, 1883; Jord. & Everm. Fish. N. and Mid. Amer. p. 900, 1896 (A pelagic fish found in all warm seas; occasional on our (American) Atlantic coast from Cape Cod to the West Indies); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 128 (**S. Africa**); Jord. & Everm. Fish. Hawaiian Islds. in Bull. U. S. Fish. Comm. xxiii, pt. 1, 1903 (1905), p. 182 and fig. (Honolulu); Jord. & Seale, Fish. Samoa, p. 229, 1906 (Hawaii; Japan; warm seas); Waite, List. Fish. New Zealand, p. 23, 1907; Jord. Tan. & Synd. Cat. Fish. Japan, p. 126, 1913 (A pelagic fish found in all warm seas).

*Naucrates noveboracensis*, Cuv. & Val. viii, p. 325, 1831 (New York).

*Naucrates koelreuteri*, Cuv. & Val. viii, p. 327, 1831 (No locality stated).

*Seriola dussumieri*, Cuv. & Val. ix, p. 217, 1833 (Gulf of Bengal).

*Seriola succincta*, Cuv. & Val. ix, p. 218, 1833 (South of St. Helena).

*Nauclerus compressus*, Cuv. & Val. ix, p. 249, pl. 263, 1833 (Molucca); Günth. Cat. Fish. ii, p. 469 (Molucca Sea), ? young.

*Nauclerus abbreviatus*, Cuv. & Val. ix, p. 251, 1833 (Atlantic Ocean).

*Nauclerus brachycentrus*, Cuv. & Val. ix, p. 253, 1833 (Indian Ocean).

*Nauclerus triacanthus*, Cuv. & Val. ix, p. 253, 1833 (Atlantic Ocean).

*Nauclerus annularis*, Cuv. & Val. ix, p. 254, 1833 (South of St. Helena).

*Nauclerus leucurus*, Cuv. & Val. ix, p. 255, 1833 (South of St. Helena).

*Naucrates cyanophrys*, Swainson, Nat. Hist. Fishes, ii, p. 412, 1839 (Palermo).

*Naucrates serratus*, Swainson, t.c. p. 413 (Palermo).

*Thynnus pomphilus*, Gronov. Syst. ed. Gray, p. 123, 1854 (Mediterranean; Spanish and American seas).

*Xystophorus*, Richards. Voy. *Erebus & Terror*, p. 52, 1844 (Palermo).

### **Lichia**, Cuv.

*Lichia*, Cuv. Règne Anim. 1817; Cuv. & Val. Hist. Nat. Poiss. viii, p. 340, 1831; Günth. Cat. Fish. ii, p. 476, 1860; Regan, Ann. & Mag. Nat. Hist. (7) xii, 1903, p. 349.

*Licdia et Temnodon* sp., Lowe, Proc. Zool. Soc. 1850, p. 248. [C.P. 3—1918]

**Lichia amia**, Linn.*(Leer-visch).*

*Amia*, Salvian. Aquat. f. 121, 1554; Willughby, Hist. Pisc. p. 296, 1686.

*Secunda glauci species*, Rondel. Aquat. p. 254, 1560; Aldrov. De Pisc. p. 303, 1638.

*Glaucus primus*, Ray, Synops. p. 94, 1713.

*Scomber no. 4*, Artedi, Gen. Pisc. p. 31 (not synonymy) 1738.

*Scomber amia*, Linn. Syst. Nat. ed. xii, i, p. 495, 1766; Bl. Schn. Syst. Ichth. p. 34, 1801.

*Caranx amia*, Lacép. Hist. Nat. Poiss. iii, p. 65, 1802 (No locality stated).

*Centronotus vadigo*, Lacép. t.c. p. 318 (Mediterranean).

*Centronotus lyzan*, Lacép. t.c.p. 430 (Coasts of Arabia); Risso, Ichth. Nice, p. 195, 1810, and Eur. Mérid. iii, p. 430, 1827.

*Lichia amia*, Cuv. Règne Anim. 1817; Cuv. & Val. viii, p. 348, 1831 (**Cape of Good Hope**; Senegal; Gorea; Mediterranean); Cuv. Règne Anim. Ill. Poiss. pl. 54, fig. 3, 1850; Pappe, Synops. Edib. Fish. C. G. Hope, p. 24, no. 29, 1853, and 2nd ed. p. 17, 1866 (*Leervisch*. Taken occasionally in **Table Bay**); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53, name only, (**Cape of Good Hope**); Casteln. Mém. Poiss. Afr. Austr. p. 39, 1861 (Rare in Cape seas. **Algoa Bay**; Mediterranean; Madeira; Teneriffe; Senegal; St. Helena; does not appear to occur east of **Agulhas Bank**); Günth. Cat. Fish. ii, p. 476, 1860 (**Cape of Good Hope**; **Cape Seas**; **Algoa Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 126 (**S. Africa**).

*Porthmeus argenteus*, Günth. t.c.p. 470, 1860 (Indian Ocean; **Cape of Good Hope**); Lutken, Vid. Selsk. Skr. 1881, pp. 507 and 600 (juvenile); Goode & Bean, Ocean. Ichth. p. 192, 1896 ("*Lichia amia*, anctorum, in its adult form, *Porthmeus argenteus* in young state, is while young a pelagic form and has been found off the West coast of Africa.")

*Skeleton*, Agassiz, Recherch. Poiss. foss. v. p. 33, pl. C\* (erroneously called *L. glaucus* in explanation of plates; it is from Mediterranean).

**Trachynotus**, Lacép.

Lacép. Hist. Nat. Poiss. iii, p. 78, 1802; Cuv. & Val. Hist. Nat. Poiss. viii, p. 398, 1831; Günth. Cat. Fish. ii, p. 480, 1860; Bouleng. Freshw. Fish. Afr. iv. p. 1, 1916.

**Trachynotus glaucus**, Linn.

*Lampuge*, Bellon. De Aquat. p. 155, 1553.

*Primi glauci species*, Rondel. Aquat. p. 252, 1560; Willughby, Hist. Pisc. p. 297, 1686.

*Scomber* no. 5, Artedi, Gen. Pisc. p. 52, 1738.  
*Scomber glaucus*, Linn. Syst. Nat. ed. xii, i, p. 494, 1766 ;  
 Bl. Schn. Syst. Ichth. p. 33, 1801 ; Shaw, Gen. Zool. iv, p. 593, 1803.  
*Gasterosteus glaucus* (Forst) Bl. Schn. t.c.p. 539, 1801 ; Forst. Deser. Anim. ed. Licht. p. 5, 1844.  
*Caranx glaucus*, Lacép. Hist. Nat. Poiss. iii, pp. 58 and 66, 1802 (Ascension ; Madagascar, particularly Fort Dauphin ; Mediterranean).  
*Centronotus glaycos*, Risso, Ichth. Nice, p. 194, 1810.  
*Lichia glaucus*, Risso, Eur. Mérid. iii, p. 429, 1827 ; Cuv. & Val. viii, p. 358, pl. 234, 1831 (Mediterranean ; Algeciras ; Madeira ; Teneriffe ; Goreé ; Brazil ; Ascension ; St. Helena ; **Cape**) ; Webb & Berth. Iles Canaries, p. 56, pl. 13, fig. 1, 1836 ; Yarrell, British Fish. ed. 3, ii, p. 232, 1859 ; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53, name only, (**Cape of Good Hope**).  
*Lichia glauca*, Günth. Cat. Fish. ii, p. 477, 1860 (Mediterranean ; Madeira ; Senegal ; **Cape Seas** ; India), and Challenger, Shore Fishes, pp. 3, 6, name only, 1880 (St. Jago ; Ascension) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 126 (**S. Africa**) ; Pellegr. Ann. Inst. Oceanogr. Poiss. tome vi, fasc. iv, 1914, p. 68 (Cap Blanc ; coasts of Mauritius ; Konakry ; Mediterranean ; Atlantic ; Gibraltar to **Cape of Good Hope** ; coasts of Brazil).  
*Lichia glaycos*, Casteln. Mém. Poiss. Afr. Austr. p. 39, 1861 (Very rare in Cape Seas ; **Algoa Bay**. It seems to inhabit the whole ocean, having been taken in the Mediterranean, at Madeira, Teneriffe, Senegal, Ascension, Brazil, St. Helena, and in **South Africa**).  
*Trachynotus glaucus*, (not of Bloch, Günther, and other authors), Regan, Ann. & Mag. Nat. Hist. (7) xii, 1903, p. 349.

#### FAMILY SCOMBRIDAE.

##### **Scomber**, (Artedi) Linn.

*Scomber* sp., Artedi, Genera Pisc. p. 30, 1738.  
*Scomber*, (Artedi) Linn. Syst. Nat. ed. x, p. 297, 1758 ; Cuv. Règne Anim. 1817 ; Cuv. & Val. Hist. Nat. Poiss. viii, p. 6, 1831 ; Günth. Cat. Fish. ii, p. 356, 1860 ; Jord. & Everm. Fish. Mid. Amer. p. 865, 1896.  
*Cordylus*, Gronov. Syst. ed. Gray, p. 163, 1854.  
*Pneumatophorus*, Jord. & Gilbert, Proc. U. S. Nat. Mus. 1882, p. 593.

##### **Scomber colias**, Gmel.

(*Cape mackerel* ; *Makreel* ; *Spanish mackerel*, of Europe ; *Chub-* or *Thimble-eyed mackerel*, of America).  
? *Colias*, Pliny, Hist. mundi xxxii, cap. ii ; Bellon. De Aquat. p. 202, 1553 ; Salvian. Aquat. f. 242, 1554 ; Rondel. Aquat. p. 235, 1560.  
[C.P. 3—1918]

*Colias rondeletii*, Ray, Synops. p. 59, 1713.

*Lacerto*, Cetti, Hist. Nat. Sard. iii, p. 190, 1774 (Sardinia).

*Scomber colias*, Gmel. Linn. Syst. Nat. i, p. 1329, 1788 (Sardinia), based on *Lacerto* of Cetti; Bl. Schn. Syst. Ithth. p. 22, 1801; Lacép. Hist. Nat. Poiss. iv, pp. 39 & 40, 1802; Turton, British Fauna, p. 100, 1807; Risso, Ichth. Nice, p. 171, 1810, and Eur. Mérid. iii, p. 413, 1827; Cuv. & Val. viii, p. 39, pl. 209, 1831 (Naples; Mediterranean); Yarrell, British Fish. i, p. 148, 1841; Dekay, New York Fauna, Fish. p. 104, pl. 11, fig. 33, 1842; Lowe, Proc. Zool. Soc. 1850, p. 248; Günth. Cat. Fish. ii, p. 361, 1860 (Mediterranean; Lisbon; South coast England and Ireland; Atlantic coasts of Europe and of United States of America); Storer, Fish. Massachusetts, p. 45, 1867; Steindr. Ichth. Notizen, vii, 1868, p. 25 (Coast of Chile), and Ichth. Berich. v, 1868, p. 3 (Spain; Portugal); Day, British Fish. i, p. 91, pl. xxxiv, 1884; Dresslar & Fesler, Rev. Scomb. in Bull. U. S. Fish. Comm. vii, 1887 (1889) p. 432, pl. ii (Massachusetts coast; Block Isld.; Santa Barbara; Albermarle Islds.; Galapagos; Venice); Jord. & Everm. Fish. N. and Mid. Amer. p. 866, 1896 (Atlantic & Pacific Oceans, widely distributed, north to England, Maine & San Francisco; very common in the Mediterranean and in Southern California); Abbott, Proc. Ac. Nat. Sc. Philad. 1899, p. 344; Delfin, Cat. Peces Chile, p. 49, 1901 (East coast N. and S. America; Japan; South coast Europe, & occasionally East coast Atlantic); Herdm. & Daw. Fish. Irish Sea, in Lancashire Sea Fish. Mém. ii, 1902, p. 37 (Brighton; Swansea; W. coast Ireland, etc.); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 246 (Natal); Pellegr. Ann. Inst. Oceanogr. Poiss tome vi, fasc. iv, 1914, p. 70 (Praya-Amelia, Angola; Mediterranean; Atlantic Ocean).

*Scomber lacertus*, Walbaum, Art. Pisc. p. 209, 1792 (Sardinia), after Cetti.

*Scomber pneumatophorus*, De la Roche, Ann. Mus. Nat. Hist. xiii, 1809, pp. 315 & 334 (Balearic Islds.); Cuv. and Val. viii, p. 36, 1831 (Balearic Islds.); Guichen. Explor. Sc. Algérie, Poiss. p. 56, 1850; Günth. Cat. Fish. ii, p. 359, 1860 (**Cape Seas**; St. Helena; Madeira; from Mediterranean southwards to **Cape of Good Hope**, crossing the Atlantic and found on the American coasts of the same latitudes); McCoy, Prodr. Zool. Vict. Dec. iii, 1879, pl. xxviii; Waite, *Thetis*, Mem. Austr. Mus. iv, 1899, p. 70 (Coast of N. S. Wales); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 127 (**S. Africa**).

*Scomber macrourus*, Rafinesque, Ind. d'Ittiol. Siciliana, p. 15, 1810 (Palermo).

*Scomber grex*, Mitchell, Trans. Lit. & Phil. Soc. New York, 1815, p. 422 (New York); Cuv. & Val. viii, p. 45, 1831 (New York; Brazil; St. Helena; **Cape**; Western shores of Atlantic Ocean); Dekay, New York Fauna, Fish. p. 103, pl. 11, fig. 32, 1842; Pappe, Synops. Edib. Fish. C. G. Hope, 1853, and 2nd ed. 1866, p. 17 (Mackerel. Common in **Table Bay** during the winter); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, pp. 53 and 67 (**Cape of Good Hope**; St. Helena; Martinique; New York; Canada); Casteln. Mém. Poiss. Afr. Austr. p. 38, 1861 (Very common at **Kalk Bay** during winter; **Cape of Good Hope**; St. Helena; U. S. America; South America).

? *Scomber capensis*, Cuv. & Val. viii, p. 56, 1831 (**Cape**).

*Scomber maculatus*, Couch, Mag. Nat. Hist. v, 1832, p. 22, fig. 8 (England).

*Scomber undulatus*, Swainson, Nat. Hist. Fishes, ii, p. 409, 1839 (Sicily).

*Scomber gracilis*, Swainson, t.c.p. 410 (Sicily).

*Scomber diego*, Ayres, Proc. Calif. Ac. Sci. 1856, p. 92 (Santa Barbara).

*Scomber dekayi*, Storer, Fish. Mass. p. 130, 1867 (Massachusetts coast).

### **Scomber scombrus**, Linn.

(*The Common Mackerel*, of Europe and America).

**Σκόμβρος**, Aristotle, Hist. Anim. vi, cap. 17, viii, cap. 12 and 13; ix, cap. 2; Ælian, De Anim. xiv, cap. 1, p. 798, A.D. 120; Athen. Deipnos. iii, p. 121 and vii, p. 321, A.D. 150; Oppian, Halieut. i, fol. 108 and 109, A.D. 200.

*Scomber*, Ovid. Halieut. v, p. 94; Pliny, Hist. mundi, ix cap. 15, xxxi cap. 8, xxxii cap. 11; Martial, iii ep. 2, iv ep. 86, xiii ep. 1; Salvian. Aquat. f. 239, b. 241 and 242, 1554; Gesner, Hist. fo. 57, 1558; Rondel, Aquat. viii, cap. 7, p. 234, 1560; Schonev. Ichth. p. 66, 1624; Aldrov. De Pisc. ii, cap. 53, p. 270, 1638; Willughby, Hist. Pisc. p. 181, tab. M3, 1686; Ray, Synops. p. 58, 1713; Ström. Söndm. ii, p. 295.

*Scomber no. 1*, Artedi, Gen. Pisc. p. 30, Species p. 68, 1738.

*Pelamys* sp., Klein, Pisces, Miss. V, p. 12, no. 5, tab. 4, fig. 1, 1749.

*Scomber scombrus*, Linn. Syst. Nat. ed. x, p. 297, 1758 (Atlantic); Lacép. Hist. Nat. Poiss. iii, p. 24, 1802 (The Ocean); Donovan, British Fish. v, pl. 120, 1808; Risso, Ichth. Nice, p. 170, 1810, and Eur. Mérid. iii, p. 412, 1827; Pallas, Zoogr. Russo-Asiat. iii, p. 215, 1811; Pennant, British Zool. iii, p. 332, pl. 51, 1812; Martens, Reise n. Venedig, ii, p. 432, 1824; Cuv. & Val. viii, p. 6, 1831 (Mediterranean); Fries och Ekstr. Skand. Fisk. p. 128, tab. 29, 1836; Parnell, Fish. Firth of Forth,

p. 50, 1838; Nordm. in Demid. Russ. Mérid. iii, p. 391, 1840; Yarrell, British Fish. 2nd ed. i, p. 137, 1841; Cuv. Règne Anim. Ill. Poiss pl. 45, fig. 1, 1850; Owen, Osteol. Cat. i, p. 61, 1853; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53, name only, (**Cape Seas**); Steindr. Ichth. Berich. v, p. 1, 1868 (Spanish coast); Day, British Fish. i, p. 83, pls. xxxii and xxxiii, 1884; Dresslar & Feslar, Bull. U. S. Fish. Comm. vii, 1887, p. 431, pl. 1 and synonymy (Woods Hole and Washington market); Jord. & Everm. Fish. N. and Mid. Amer. p. 865, 1896 (North Atlantic; abundant on both coasts, North to Norway and Labrador, south to Spain and Cape Hatteras); Herdm. & Daw. Fish. Irish Sea, in Lancashire Sea Fish. Mem. ii, 1902, p. 37 (British coast).

*Scomber* sp., Gronov. Zoophyl. no. 304, 1763.

*Scomber scomber*, Linn. Syst. Nat. ed. xii, p. 492, 1766; Brünn. Ichth. Massil. p. 68, 1768; Bl. Ichth. taf. 54, 1797; Bl. Schn. Syst. Ichth. p. 24, 1801 (Baltic); Günth. Cat. Fish. ii, p. 357, 1860 (Mediterranean; Dalmatia; Lisbon; British coasts; Boston); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 127 (**S. Africa**).

*Scomber vernalis*, Mitchell, Trans. Lit. Phil. Soc. N. York, i, 1815, p. 423 (Sandy Hook); Cuv. & Val. viii, p. 48, 1831 (Sandy Hook, New York). Richards. Fauna Bor. Amer. Fish. p. 80, 1836; Storer, Fish. Massachusetts, p. 41, 1839 (Boston), and Hist. Fish. Mass. p. 132, 1867 (Long Point); Dekay, New York Faun. Fish. p. 101, pl. 12, fig. 34, 1842 (New York).

*Cordylus scombrus*, Gronov. Syst. ed. Gray, p. 163, 1854 (Seas of Europe).

### Thynnus, Cuv.

*Thynnus*, Cuv. Règne Anim. 1st ed. p. 313, 1817 (not of Fabricius, 1775, a genus of Butterflies); Cuv. & Val. Hist. Nat. Poiss. viii, p. 57, 1831; Günth. Cat. Fish. ii, p. 362, 1860.

*Orcynus*, Cuv. Règne Anim. 1st ed. p. 314, 1817 (not *Orcynus* of Rafinesque, Anal. de la Nature, 1815, which is equivalent to *Scomberoides*).

*Thunnus*, South, Encyclop. Metropol. v, 1845, p. 620; Jord. Tan. & Snyder, Cat. Fish. Japan, p. 120, 1913.

*Germo*, Jordan, Proc. Ac. Sc. Philad. 1888, p. 180; Jord. & Everm. Fish. N. and Mid. Amer. p. 870, 1896.

### Thynnus alalonga, Gmel.

(*Long-finned Albacore*).

*Alilonghi*, Duhamel, Pêches, ii, sect. 7, p. 203, 1777.

*Ala-lunga*, Cetti, Hist. Nat. Sard. iii, p. 191, 1777 (Sardinia).

*Scomber alatunga*, Gmel. Linn. Syst. Nat. p. 1330, 1788 (Sardinia), based on Cetti, misprint for "alalunga."

*Scomber germo*, Lacép. Hist. Nat. Poiss. ii, p. 598, and iii, p. 1, 1802 (17° S. Lat., 103° W. Long.)

*Orcynus alalonga*, Risso, Eur. Mérid. iii, p. 419, 1827; Jord. & Gilbert, Proc. U. S. Nat. Mus. 1880, p. 456 (Monterey Bay; Santa Barbara; San Pedro). no description, and Synops. p. 428, 1883; Gorde, Nat. Hist. Aquat. anim. p. 326, pl. 95A, 1884 (Banqueran).

*Thynnus atlanticus*, Lesson, Voy. *Coquille*, Zool. ii, p. 165, 1828 (Atlantic Ocean).

*Thynnus alalonga*, Cuv. & Val. viii, p. 120, pl. 215, 1831 (Western coast of France); Lowe, Trans. Zool. Soc. iii, 1842, p. 4; Cuv. Règne Anim. Ill. Poiss. pl. 47, fig. 1, 1850; White, Cat. British Fish. p. 31, 1851; Yarrell, British Fish. 3rd ed. ii, p. 220, 1859; Günth. Cat. Fish. ii, p. 366, 1860 (**Cape of Good Hope**; Atlantic); Steindr. Ichth. Berlch. v, 1868, p. 7; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 128 (**S. Africa**). Pellegr. Ann. Inst. Oceanogr. Poiss. tome vi, fasc. iv, 1914, p. 71 (Coasts of Mauritius; Mediterranean; Atlantic; American coasts of the Pacific).

*Thynnus pacificus*, Cuv. & Val. viii, p. 133 (27° and 26° S. Lat., 103° W. Long.); Günth. t.c.p. 366 (27° and 26° S. Lat., 103° W. Long., and tropical parts of Indian Ocean).

*Thynnus argenti-vittatus*, Cuv. & Val. viii, p. 134 (Atlantic and the Indies); Günth. t.c.p. 366 (Atlantic).

*Thynnus balteatus*, Cuv. & Val. viii, p. 136 (Tropical parts of the Atlantic).

*Thynnus albacora*, Lowe, Proc. Zool. Soc. 1839, p. 77 (Madeira), and Trans. Zool. Soc. iii, 1842, p. 4; Günth. t.c.p. 365 (Atlantic).

*Thynnus macropterus*, Temm. & Schleg. Fauna Japon, Poiss. p. 98, pl. 51, 1850 (Japan).

*Orcynus albacora* and *galeatus*, Poey, Enum. Pisc. Cubens. p. 71, 1875 (Cuba).

*Orcynus subulatus*, Poey, t.c.p. 71, 1875 (Cuba); Lutken, Spolia Atlantica, p. 596, 1880.

*Orcynus germo*, Lutken, t.c.p. 474, 1880.

*Orcynus argenti-vittatus*, Goode, Nat. Hist. Aquat. Anim. p. 320, 1884.

*Albacora alalonga*, Dresslar & Fesler, Bull. U. S. Fish. Comm. vii, 1887 (1889), p. 438 (warm seas; north to Japan, Southern California and the Grand Banks of Newfoundland; south to **Cape of Good Hope**).

*Germo alalunga*, Jord. & Everm. Fish. N. and Mid. Amer. p. 871, 1896 (Tropical seas; pelagic and widely distributed. Rarely seen on Atlantic coast of America, but very common in the Mediterranean. Found on the Pacific coast as far north as San Francisco and is ex-

tremely abundant in the spawning season about the Santa Barbara Islands).

*Thunnus alalunga*, Jord. Tan. & Snyd. Cat. Fish. Japan, p. 120, 1913 (Atlantic and Pacific Oceans; Indian Ocean; Japan).

**Gymnosarda**, Gill.

*Gymnosarda*, Gill, Proc. Ac. Nat. Sc. Philad. 1862, p. 125; Jord. & Everm. Fish. N. and Mid. Amer. p. 868, 1896.

*Thynnus*, Lütken, Spolia Atlantica, p. 460, 1880, not of Cuv. & Val.

*Thynnichthys*, Giglioli, Cat. Pesci Italiana, p. 25, 1880, not *Thynnichthys*, Bleeker.

*Euthynnus*, Lütken, M. S. in Jord. & Gilb. Synops. p. 429, 1883.

**Gymnosarda pelamys**, Linn.

(*Oceanic Bonito*).

*Scomber pelamys*, Linn. Syst. Nat. ed. x, p. 297, 1758, and ed. xii, i, p. 492, 1766 ("In Pelago inter Tropicos"); Bl. Schn. Syst. Ichth. p. 23, 1801; De la Roche, Ann. Mus. xiii, p. 315, 1809; Bennet, Whaling Voy. ii, p. 281, 1840.

*Scomber pelamides*, Lacép. Hist. Nat. Poiss. ii, pl. xx, fig. 2, 1800, and iii, p. 14, 1802 (Pacific and Atlantic Oceans), after Linnaeus.

*Variletta*, Humboldt, Obs. Zool. ii, p. 190.

*Thynnus pelamys*, Cuv. & Val. viii, p. 113, pl. 214, 1831 (Rio Janeiro; coast of Africa; Indian Ocean); Schleg. Fauna Japon. Poiss. p. 96, pl. 49, 1844; Richards. Ichth. China, p. 267, 1846; Cuv. Règne Anim. Ill Poiss. pl. 47, fig. 2, 1850; Blkr. Act. Soc. Sc. Indo-Neerl. i, 1856, p. 41 (Amboina), and Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53, name only, (**Cape of Good Hope**); Yarrell, British Fish. 3rd. ed. i, p. 157, 1859; Günth. Cat. Fish. ii, p. 364, 1860 (**Cape Seas**); Playfair, Fish. Zanz. p. 67, 1866 (Zanzibar); Day, Fish. India, p. 252, 1876 (India and Atlantic Oceans), and Fish. Great Britain & Ireland i, p. 100, pl. xxxvii, 1884 (Solway Firth); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 127 (**S. Africa**); Steindr. Fische Süd-arab and Sokotra, p. 42, name only, 1902 (East coast Arabia); Herdm. & Daw. Fish. Irish Sea, in Lanc. Sea Fish. Mem. no. ii, 1902, p. 38 (British coasts).

*Thunnus pelamys*, Parnell, Fish. Firth of Forth, p. 53, 1838.

*Thynnus vagans*, Lesson, Voy. Coquille, Zool. ii, p. 162, pl. 32, 1838.

*Thynnus pelamis*, Steindr. Ichth. Berich. v, p. 7, 1868.

*Orcynus pelamys*, Poey, Synops. Pisc. Cubens. p. 362, 1868, and Enum. Pisc. Cubens. p. 72, 1875 (Cuba); Goode

& Bean, Proc. U. S. Nat. Mus. xxiv, 1878 (Princeton, Mass.); Goode, Hist. Nat. Aquat. Anim. pp. 316, 319, pl. 95B, 1884 (Princeton and Woods Hole, Mass.).

*Euthynnus pelamys*, Jord. & Gilbert, Synops. p. 430, 1883.

*Gymnosarda pelamis*, Dresslar & Fesler, Bull. U. S. Fish. Comm. vii, 1887, p. 436, pl. iv, (warm seas; north to Cape Cod and Bermudas); Jord. & Everm. Fish. N. and Mid. Amer. p. 868, 1896 (warm seas; pelagic; not very common; north to Cape Cod and Bermudas on the Atlantic coast of America, once recorded from California); Jord. & Everm. Fish. Hawaiian Islds. in Bull. U. S. Fish. Comm. xxiii, pt. 1, 1903 (1905) p. 172 and fig. (Honolulu; abundant about Hawaii in summer); Jord. & Seale, Fish. Samoa, p. 228, 1906 (Hawaii; warm seas); Everm. & Seale, Fish. Philippine Islds. p. 61, 1907 (Bulan); Waite, List Fish. in Rec. Canterbury Mus. i, no. 1, 1907, p. 24 (New Zealand).

### Sarda, Cuv.

*Sarda*, Cuv. Règne Anim. 2nd ed. ii, p. 199, 1829; Dresslar & Fesler, Bull. U. S. Fish. Comm. vii, 1887, p. 440; Jord. & Everm. Fish. N. and Mid. Amer. p. 871, 1896.

*Pelamys*, Cuv. & Val. Hist. Nat. Poiss. viii, p. 149, 1831 (not *Pelamys* of Daudin, a genus of snakes); Günth. Cat. Fish. ii, p. 367, 1860.

### Sarda sarda, Bl.

(*The Bonito*).

*Pelamys*, Bellon. De Aquat. p. 179, 1553; Salvian. Aquat. fo. 123, 1554.

*Amia*, Rondel. De Pisc. p. 238, 1554.

*Sarda*, Rondel. t.c.p. 248 (juvenile).

*Thynnus*, Aldrov. De. Pisc. iii, cap. 18, p. 313, 1638.

*Pelamys bellonii*, Willughby, Hist. Pisc. p. 180, 1686.

*Scomber no. 2* (*Thynnus thynnus*) var., Artedi, Synon. Pisc. p. 50, 1738.

*Scomber*, *pelamys*, Brünn. Ichth. Massil. p. 68, 1768 (Marseilles), not of Linnaeus.

*Scomber sarda*, Bl. Ichth. x, p. 35, taf. 334, 1793 (Europe); Bl. Schn. Syst. Ichth. p. 22, 1801; Lacép. Hist. Nat. Poiss. iv, pp. 699 and 700, 1802 (Mediterranean; The Ocean); Mitchell, Trans. Lit. & Phil. Soc. New York, i, 1815, p. 248.

*Scomber mediterraneus*, Bl. Schn. t.c.p. 23, 1801 (Marseilles); De la Roche, Ann. Mus. xiii, 1809, p. 336.

*Scomber ponticus*, Pall. Zoogr. Russo-Asiat. p. 17, 1811.

*Scomber pelamitus*, Rafinesque, Caratteri, p. 44, pl. 2, 1810 (Palermo).

*Thynnus sarda*, Risso, Eur. Mérid. iii, p. 417, 1827.

*Pelamys sarda*, Cuv. & Val. viii, p. 149, pl. 217, 1831 (Cape Verde; coast of France); Yarrell, British Fish. ed. i, p. 159, 1836; Webb & Berth. Iles Canaries, Poiss. p. 50, 1836; Storer, Fish. Mass. p. 4, and Rep. Fish. Mass. p. 49, 1839 (Holmes' Hole, Martha's Vineyard), and Hist. Fish. Mass. p. 141, 1867; Nordm. in Demid. Voy. Russ. Mérid. iii, p. 392, 1840; Dekay, New York Fauna, Fish. p. 106, pl. 9, fig. 27, 1842 (New York Harbour); Cuv. Règne Anim. Ill. Poiss. pl. 48, fig. 2, 1850; Guichen. Explor. Algér. Poiss. p. 58, 1850; Lowe, Proc. Zool. Soc. 1850, p. 248; Ayres, Proc. Calif. Ac. 1855, p. 74; Günth. Cat. Fish. ii, p. 367, 1860 (**Cape of Good Hope**; North America). and Fish. Central. Amer. p. 435, 1868; Steindr. Ichth. Berich. v, 1868, p. 8; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 128 (**S. Africa**); Pellegr. Ann. Inst. Oceanogr. Poiss. tome vi, fasc. iv, 1914, p. 71 (Dakar; Senegal coasts; Mediterranean; Atlantic, to **Cape of Good Hope**).

*Sarda mediterranea*, Jord. & Gilb. Synops. p. 427, 1883, and Proc. U. S. Nat. Mus. 1884, p. 19; Goode, Nat. Hist. Aquat. Anim. p. 316, pl. 92, 1884 (Woods Hole, Mass.).

*Sarda sarda*, Jord. & Gilb. Proc. U. S. Nat. Mus. 1884, p. 19; Dresslar & Fesler, Bull. U. S. Fish. Comm. vii, 1887 (1889) p. 440 (Wood's Hole; coasts of America and Europe; Cape Cod to **Cape of Good Hope**); Jord. & Everm. Fish. N. and Mid. Amer. p. 872, 1896 (Atlantic Ocean, on both coasts, north to Cape Cod; very abundant).

### **Scomberomorus**, Lacép.

*Scomberomorus*, Lacép. Hist. Nat. Poiss. iii, p. 292, 1802; Dresslar & Fesler, Bull. U. S. Fish. Comm. vii, 1887, p. 441; Jord. & Everm. Fish. N. and Mid. Amer. p. 873, 1896.

*Cybium*, Cuv. Règne Anim. 2nd ed. ii, p. 120, 1829; Cuv. & Val. Hist. Nat. Poiss. viii, p. 164, 1831; Günth. Cat. Fish. ii, p. 369, 1860.

*Apodontis*, Bennet, Proc. Comm. Zool. Soc. i, p. 169, 1831.

*Lepidocybium*, Gill, Proc. Ac. Nat. Sc. Philad. 1862, p. 125.

*Chriomitra*, Lockington, Proc. Ac. Nat. Sc. Philad. 1879, p. 133.

*Scomberodon*, Von Beneden, (fossil).

### **Scomberomorus commersoni**, Lacép.

*Scomber commersonii*, Lacép. Hist. Nat. Poiss. ii, p. 600, pl. 20, fig. 1, 1800 (No locality stated); Shaw, Zool. iv, p. 589, pl. 85, 1803.

*Scomber masulosus*, Shaw, Nat. Misc. No. 982, Zool. iv, p. 592, 1803.

*Scomber konam*, Russell, Fish. Vizagapatam, ii, p. 27, pl. 135, 1803.

*Cybium commersonii*, Cuv. Règne Anim. 2nd ed. ii, p. 120, 1829; Rüpp. Atlas Fische, p. 94, taf. 25, fig. 1, 1828, and N. W. Fische, p. 41, 1838; Cuv. & Val. viii, p. 165, 1831 (Red Sea; Isle de France; Pondicherry; Martinique); Richards. Ichth. China, p. 268, 1846; Cantor, Cat. Malayan Fish. p. 108, 1849; Jerdon, Madras Journ. Lit. Sci. 1851, p. 136; Günth. Cat. Fish. ii, p. 370, 1860 (**Cape Seas**; Malayan Peninsula); Day, Fish. Malabar, p. 69, 1865, and Fish. India, p. 255, pl. lvi, fig. 5, 1876 (Madras); Playfair, Fish. Zanz. p. 67, 1866 (Zanzibar); Klunz. Verh. Zool.-bot. Ges. Wien, 1871, p. 444; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 128 (**S. Africa**); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 248 (Natal).

*Cybium konam*, Blkr. Nat. Tijds. Ned. Ind. i, 1851, Makr. p. 357 (Indian Archipelago).

*Scomberomorus commersoni*, Jord. & Seale, Fish. Samoa, p. 228, 1906 (New Guinea; East Indies). and Fish. Luzon and Panay, p. 13, 1907 (Cavite).

### **Scomberomorus flavobrunneum**, Smith.

*Cybium flavobrunneum*, Smith, Ill. Zool. S. Afr. Pisces, pl. 20, 1849 (now and then caught in the seas about the **Cape of Good Hope**); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53, name only (**South Africa**); Günth. Cat. Fish. ii, p. 373, 1860 (**Cape of Good Hope**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 128 (**S. Africa**); Weber, Fische Aru und Kei-Ins. p. 31, 1911 (Barkai, Aru Islds.).

## FAMILY TRICHIURIDAE.

### **Thyrsites**, Cuv. & Val.

Cuv. & Val. Nat. Hist. Poiss. viii, p. 196, 1831; Gay, Hist. Chile, Zool. ii, p. 223, 1848; Günth. Cat. Fish. ii, p. 350, 1860; Gill, Proc. Ac. Nat. Sc. Philad. 1862, p. 126.

### **Thyrsites atun**, Euphr.

(*The Snoek*; *Barracouta*; *Sierra*).

*Scomber atun*, Euphrasen, Vetensk. Acad. Nya Handl. xii, Stockh. 1791, p. 315.

*Acinacée bâtarde*, Bory St. Vincent, Voy. aux quâtres iles d'Afrique, i, pl. 4, fig. 2.

*Thyrsites atun*, Cuv. & Val. viii, p. 196, pl. 219, 1831 (Seas round the **Cape of Good Hope**. Very abundant in summer. Found on **Agulhas Bank** in winter; ? New Zealand); Valenc., Cuv. Règne Anim. Ill. Poiss. pl. 49, fig. 1, 1850; Pappe, Edib. Fish. C. G. Hope, ed. 1, 1853, and ed. 2, [C.P. 3—1918]

1866, p. 17 (caught in immense numbers all the year round, but more frequently during summer. **Cape of Good Hope**) ; Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, pp. 50 and 68 (**Cape Seas**) ; Günth. Cat. Fish. ii, p. 350, 1860 (**Cape of Good Hope**) ; Van Diemens Land ; ? Chile), and Challenger, Shore Fishes, p. 24, 1880 (Valparaiso) ; Casteln. Mém. Poiss. Afr. Austr. p. 42, 1861 (Very common in **Table Bay**). Appears about the middle of August, but is not abundant until September and disappears towards the end of June) ; Delfin, Cat. Peces Chile, p. 50, 1901 (Coast of Valparaiso) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 124 and Mar. Biol. Rept. ii, 1914, pp. 116-125 and fig. (**S. Africa**) ; Waite, List Fish. in Rec. Canterbury Mus. i, no. 1, p. 24, 1907 (New Zealand) ; McCulloch, Res. F.I.S. *Endeavour*, in Trade & Customs Rep. Australia, Fish. i, pt. 3, 1911, p. 80 (Flinders Isld, Investigator group, S. Australia, 37 fms. ; 40 m. West of Kingston, 30 fms. ; young) ; Regan, *Terra Nova* Antarctic Exped. Zool. i, no. 1, p. 16, 1914, name only (Cape North, New Zealand).  
*Thyrsites chilensis*, Cuv. & Val. viii, p. 204, 1831 (Valparaiso) ; Gay, Hist. Chile, Zool. ii, p. 226, 1848.  
*Thyrsites altivelis*, Richards. Proc. Zool. Soc. 1839, p. 99.

### **Lepidopus**, Gouan.

*Lepidopus*, Gouan, Hist. Nat. Poiss. p. 185, 1770 ; Cuv. & Val. Nat. Hist. Poiss. viii, p. 218. 1831 ; Günth. Cat. Fish. ii, p. 344, 1860 ; Goode & Bean, Ocean. Ichth. p. 202, 1896 ; Jord. & Everm. Fish. N and Mid. Amer. p. 886, 1896.

*Vandellius*, Shaw, Zool. iv, p. 199, 1803.

*Sarcina*, Rafinesque, Caratteri, nuovi gen. Sicilia, p. 20, 1810. *Ziphotheca*, Montagu, Werner-Mem. i, 1811, pls. 2 & 3, and ii, p. 432.

### **Lepidopus caudatus**, Euphr.

(Scabbard-fish ; Frost-fish ; Kalk-visch).

? *Serpent marin*, Leguat, Voy. et Avent. ii, p. 40, 1718.

*Lepidopus*, Gouan, Hist. Nat. Poiss. pl. 1, fig. 4, 1770, Bowditch, Excursion Madeira, p. 10, fig. 1, 1825.

*Trichiurus caudatus*, Euphrasen, K. Vet. Acad. Nya Hand. Stockh. ix, 1788, p. 52, tab. 9, fig. 2.

*Trichiurus ensiformis*, Vandelli, Ac. Sc. Lisbon, 1797 (Lisbon).

*Lepidopus gouani*, Bl. Schn. Syst. Ichth. p. 239, tab. 53, fig. 2, 1801 ; Risso, Ichth. Nice, p. 151, 1810, and Eur. Mérid. iii, p. 290, 1827.

*Trichiurus gladius*, Holten, Kjobenh. Skrvt. Af. Nat. Selsk. v, p. 23, tab. 2, fig. 1, 1802.

*Vandellius lusitanicus*, Shaw, Zool. iv, p. 199, 1803 (Portugal).

*Lepidopus lusitanicus*, Leach, Zool. Misc. ii, p. 7, pl. 62.

*Lepidopus peronii* Risso, Ichth. Nice, p. 148, pl. 5, fig. 18, 1810 (Nice).

*Zyphotheca tetrodens*, Montagu, Werner. Mem. i, 1811, p. 82, tab. 2 and 3, and ii, p. 432 (Great Britain).

*Lepidopus argenteus*, Nardo, Giorn. di Fis. Par. vii, p. 227.

*Lepidopus argyreus*, Cuv. Règne Anim. 1817; Cuv. & Val. viii, p. 223, pl. 223, 1831 (France); Yarrell, British Fish. i, p. 198, 1841; Lowe, Trans. Zool. Soc. ii, 1841, p. 181; Guichen. Explor. Algér. Poiss. p. 59, 1830; Pappe, Synops. Edib. Fish. C. G. Hope, 1853, and 2nd ed. p. 18, 1866 (*Kalk-visch*, *Scabbard-fish*. **Table Bay**, very rare); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53, name only (**Cape of Good Hope**).

*Lepidopus caudatus*, White, List British Fish. p. 32, 1851; Günth. Cat. Fish. ii, p. 344, 1860 (English coast; Lisbon; South Europe; Atlantic; **Cape Seas**), and *Challenger*, xxii, Deep Sea Fish. p. 37, 1887 (Rather common in Mediterranean and warmer parts of Atlantic, at **Cape of Good Hope**, in the seas round Tasmania and New Zealand, and on coast of California); Casteln. Mém. Poiss. Afr. Austr. p. 43, 1861 (*Lyre-fish*. Very rare at the **Cape**—found on the coasts of the Atlantic and Mediterranean); Goode & Bean, Ocean. Ichth. p. 203, fig. 213, 1896 (Taken many times during the century, from Norway to **South Africa**. Also known as the *Frost-fish* about Tasmania and New Zealand); Jord. & Everm. Fish. N. and Mid. Amer. p. 886; 1896 (Pelagic, occasional in the Atlantic, from Norway to **South Africa** and New Zealand. In New Zealand it comes to the surface periodically in great numbers to deposit its spawn); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 124 (**S. Africa**), and Mar. Biol. Rept. ii, 1914, p. 125 and fig. (American waters; Europe; **South Africa**); South-east coast of Australia and Tasmania: in greatest abundance in New Zealand); Waite, Rec. Canterbury Mus. i, no. 1, 1907, p. 24 (New Zealand); Regan, Col. Fish. in Ann. Natal Govt. Mus. i, pt. 3, 1908, p. 246 (**Bird Islds.**), and *Terra Nova* Antarctic Exped. Zool. i, no. 1, p. 16, 1914, name only (Cape North, New Zealand); McCulloch, Results *F. I. S. Endeavour*, in Trade and Customs, Australia, Rep. iii, pt. 1, 1915, p. 52 (off Genoa Peak, Victoria, 200 fms.; off Gabo Isld. 240 fms.).

### **Gempylus**, Cuv. & Val.

*Gempylus*, Cuv. & Val. Hist. Nat. Poiss. viii, p. 207, 1831; Günth. Cat. Fish. ii, p. 352, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 883, 1896.

*Lemnisoma*, Lesson, Voy. *Coquille*, Poiss. p. 160, 1831.

*Zyphothycus*, Swainson, Nat. Hist. Fishes, ii, p. 239, 1839.

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**Gempylus serpens**, Cuv. & Val.*(The Snake Mackerel).**Scomber serpens*, Solander M.S.S.

*Gempylus serpens*, Cuv. & Val. viii, p. 207, 1831 (Martinique); Cuv. *Règne Anim. Ill. Poiss. pl. xl ix*, fig. 2, 1850; Günth. *Cat. Fish. ii*, p. 352, 1860 (Tropical parts of Atlantic, especially Caribbean Sea), *Fische Südsee*, i, p. 106, taf. lxviii, fig. 3, 1873 (Sandwich Islds.), and *Challenger*, xxii, Deep Sea Fish. p. 41, 1887 (Canary Islds.; Caribbean Sea; near Society and Sandwich Islds.); Lutken, K. *Dansk. Vidensk. Selsk. Skriv. xii*, 1880, p. 456, taf. iii, figs. 5-8; Goode & Bean, *Ocean. Ichth.* p. 202, 1896 (Rarely in Canary Islds.; in Caribbean Sea and near Society and Sandwich Islds.; generally believed to be an inhabitant of great depths); Jord. & Everm. *Fish. N. and Mid. Amer.* p. 884, 1896 (Deep seas; a rare fish, widely distributed); Jord. *Tan. & Snyd. Cat. Fish. Japan*, p. 122, 1913 (Hawaii; Tahiti; West Indies; Japan); Gilchrist, *Mar. Biol. Rept. ii*, 1914, p. 126 and fig. (**East London**).

*Lemnisoma thyrsitoides*, Lesson, *Voy. Coquille*, Poiss. ii, p. 160, 1831 (South Pacific near Paumotu Islds., 17° S. Lat. 108° E. Long.); Jord. & Everm. *Fish. Hawaiian Islds.* in *Bull. U. S. Fish. Comm. xxiii*, 1903 (1905) p. 179 (Puna, S. of Hilo).

*Gempylus ophidianus*, Poey, *Mem. Hist. Nat. Cuba*, ii, p. 246, 1861 (Cuba).

**Trichiurus**, Linn.

*Trichiurus*, Linn. *Syst. Nat. ed. x*, p. 246, 1758, and *ed. xii*, i, p. 429 1766; Cuv. *Règne Anim.* 1817; Cuv. & Val. *Hist. Nat. Poiss. viii*, p. 235, 1831; Günth. *Cat. Fish. ii*, p. 346, 1860; Jord. & Everm. *Fish. N. and Mid. Amer.* p. 889, 1896; Goode & Bean, *Ocean. Ichth.* p. 194, 1896.

*Gymnogaster*, Gronov. *Mus. Ichth.* i, p. 17, no. 47, 1754, and *Zoophyl.* i, p. 136, 1763.

*Enchelyopus* (Klein), Bleeker, *Mém. Poiss. Guinée*, 9, p. 73, 1862.

*Lepturus* (Artedi), Gill, *Proc. Ac. Nat. Sci. Philad.* 1862, p. 126.

**Trichiurus haumela**, Forsk.*(The Hair-tail).*

*Clupea haumela*, Forsk. *Descr. Anim.* p. 72, 1775 (Red Sea); Gmel. *Linn. Syst. Nat.* p. 1408, 1793.

*Trichiurus lepturus*, Lacép. Hist. Nat. Poiss. ii, pl. 7, fig. 1, 1802, not of Cuvier (Central America; Eastern Seas; China); Russell, Fish. Vizagapatam, i, p. 30, and *Sawal*, pl. 41, 1803 (Vizagapatam); Ham. Buch. Fish. Ganges, pp. 31 and 364, 1822.

*Trichiurus haumela*, Bl. Schn. Syst. Ichth. p. 518, 1801; Cuv. & Val. viii, p. 249, 1831 (Malabar; Vizagapatam); Rüpp. N. W. Fische, p. 41, 1838; Swainson, Fishes, ii, p. 254, 1839; Cantor, Cat. Malayan Fish. p. 113, 1849; Jerdon, Madras Journ. Lit. Sci. 1851, p. 139; Blkr. Verh. Bat-Gen. xxiv, 1852, Makr. p. 41 (Sunda-Molucca Archipelago); Günth. Cat. Fish. ii, p. 348, 1860 (Malayan Peninsula; Amboina); Kner, *Novara*, Fische, p. 140, 1865; Day, Fish. Malabar, p. 66, 1865, and Fish. India, p. 201, 1876 (East coast Africa; seas and estuaries of India, and the Malay Archipelago to China); Playf. Fish. Zanzibar, p. 55, 1866 (Bagamoio, East coast Africa); Klunz. Verh. Zool.-bot. Ges. Wien, 1871, p. 471; Vincenzerrà, Viaggio, Birmania, p. 42, 1890 (Rangoon); Steindr. Fische, Süd-arab und Sokotra p. 20, 1902 (Gischin); Everm. & Seale, Fish. Philippine Islds. p. 62, 1907 (San Fabian); Jord. & Rich. Fish. Islds. Philippine Archip. p. 251, 1908 (Manila); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 238 (Natal); Seale, Fish. Borneo, p. 272, 1910 (Sandakan; Philippines); Jord. Tan. & Snyd. Cat. Fish. Japan, p. 125, 1913 (Indian Ocean and Archipelago; Manila; San Fabian; Cavite; Japan); Gilchr. Mar. Biol. Rep. ii, 1914, p. 127 and fig. (warm shallow waters of the tropics, sometimes even entering rivers. Rather rare in **S. Africa**; **East London** and **Buffalo River**. Several specimens found by *P. Faure* (s) when trawling in shallow waters).

*Trichiurus malabaricus*, Day, Fish. Malabar, p. 65, pl. v, 1865.

*Enchelyopus haumela*, Blkr. Versl. Akad. Amst. (2) ii, 1868, Bintang, p. 4.

#### FAMILY HISTIOPHORIDAE.

**Histiophorus**, Lacép.

*Istiophorus*, Lacép. Hist. Nat. Poiss. iii, p. 374, 1802; Valenc. Poiss. du Règne Anim. de Cuvier, p. 124, 1850; Jord. & Everm. Fish. N. and Mid. Amer. p. 890, 1896.

*Makaira*, Lacép. t.c. iv, p. 688, 1803

*Notistium*, Hermann, Observ. Zool. p. 305, 1804.

*Histiophorus* (amended spelling), Cuv. & Val. Hist. Nat. Poiss. viii, p. 291, 1831; Günth. Cat. Fish. ii, p. 512, 1860.

*Machaera*, (amended spelling), Cuv. & Val.

*Tetrapturus* (Rafinesque), Cuv. & Val. t.c.p. 280, 1831.

*Macaria* (amended spelling), Nardo, Isis, xxvi, Col. 418, 1833.

*Zanclurus*, Swainson, Nat. Hist. Fish. Amph. & Rept., ii, p. 239, 1839.

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**Histiophorus gladius**, Brouss.*(The Sail-fish).*

Nieuhoff, Embassy to China, p. 237, 1673 ; Marcgrave, Hist. Nat. Brazil, p. 171, 1648 ; Willughby, App. pl. 5, fig. 9, 1686 ; Valent. Descr. Amboinensis, iii, p. 509, fig. 125, 1726 ; Renard, Poiss. Moluques, i, t. 34, fig. 182, ii, t. 54, fig. 233, 1754.

*Scomber gladius*, Brouss. Mém. Acad. Sc. 1786, p. 454, pl. 10 ; Bl. Ichth. taf. 345, 1797.

*Xiphias ensis*, Lacép. Hist. Nat. Poiss. ii, p. 296, 1800 (No locality stated).

*Xiphias velifer*, Bl. Schn. Syst. Ichth. p. 93, 1801.

*Istiophorus gladius*, Lacép. Hist. Nat. Poiss. iii, pp. 374 and 375, 1802 (Seas of East and West Indies ; Madagascar ; Isle de France ; Surat).

*Xiphias platypterus*, Shaw, Zool. iv, p. 101, 1803.

*Histiophorus indicus*, Cuv. & Val. viii, p. 293, pl. 229, 1831 (Red Sea ; Indian Ocean ; Amboina) ; Cuv. Règne Anim. Ill. Poiss. pl. 53, fig. 1, 1850 ; Jerdon, Madras Journ. Lit. Sci. 1851, p. 139.

*Histiophorus americanus*, Cuv. & Val. viii, p. 303, 1831 (Brazil ; Atlantic coasts of Africa) ; Guichen. Poiss. in Ramen de la Sagra, Hist. Cuba, p. 105, 1845.

*Histiophorus gladius*, Günth. Cat. Fish. ii, p. 513, 1860 (Indian Ocean ; **Cape of Good Hope** ; ? N. S. Wales) ; Playfair, Proc. Zool. Soc. 1867, p. 856 ; Day, Fish. India, p. 198, 1876 (common in cold season off Madras) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 123 (**S. Africa**).

**Histiophorus granulifer**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 42, 1861 (Described from a mutilated specimen in the South African Museum, **Cape Town**, found on the beach at **St. Sebastian Bay** after a violent storm) ; Gilchr. Cat. Fish. in Mar. Inv. S. Africa, i, 1902, p. 123 (quoted from Castelnau).

**Tetrapurus**, Rafinesque.

*Tetrapurus*, Rafinesque, Indice d'Ittiol. Sicil. p. 30, 1810 ; Jord. & Everm. Fish. N. and Mid. Amer. p. 891, 1896.

*Skeponopodus*, Nardo, Isis, xxvi, 1833, Cols. 416, 419.

*Histiophorus* (part), Günth. Cat. Fish. ii, p. 512, 1861.

**Tetrapurus herschelii**, Gray.

*Tetrapurus herschelii*, Gray, Ann. Nat. Hist. i, 1838, p. 313, pl. 10, (**Table Bay** ; **Cape of Good Hope**) ; Lutken, Spolia Atlantica, p. 441, 890.

? *Tetrapurus indicus*, Cuv. & Val. viii, p. 286, 1831 (Sumatra ; on a figure by Banks).

*Histiophorus herschelii*, Günth. Cat. Fish. ii, p. 513, 1861  
**Table Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 123 (**S. Africa**).

*Histiophorus brevirostris*, Playfair, Fish. Zanzibar, p. 53, 1866 (Zanzibar).

? *Tetrapurus imperator*, Jord. & Everm. Fish. N. and Mid. Amer. p. 892, 1896 (West Indies; ranging occasionally northwards to Cape Cod).

### FAMILY XIPHIIDAE.

#### **Xiphias**, Artedi.

*Xiphias*, Artedi, Gen. Pisc. p. 29, 1738; Linn. Syst. Nat. ed. x, p. 248, 1758; Günth. Cat. Fish. ii, p. 511, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 893, 1896.

*Xiphias et Machaera*, Cuv. Règne Anim. 1817.

#### **Xiphias gladius**, Linn.

(*The Sword-fish*).

**Xiphias**, Aristotle, De Nat. Anim. ii, cap. 13, 15; viii, cap. 19; Ælian, De Anim. Nat. ix, cap. 40; xiv, cap. 23; Athen. Deipnos. vii, p. 314; Oppian, De Pisc. i, p. 8; ii, p. 48.

*Xiphias*, Ovid, Halieut. v, p. 67; Pliny, Hist. mundi, xxxii, cap. 2, p. 11; Bellon. Hist. Nat. Pisc. p. 109, 1551; Gesner. Hist. Anim. p. 1049, 1558; Rondel. De Pisc. viii, cap. 15, p. 251, 1560; Willughby, De Hist. Pisc. p. 161, tab. L 27, fig. 2, 1686; Ray, Synops. Meth. Pisc. p. 52, 1713; Artedi, Gen. Pisc. p. 30, 1738.

*Gladius*, Pliny, Hist. mundi, ix, cap. 15; Salvian. Aquat. f. 126, 127, 1554; Gesner. t.c.p. 379, 1558; Schonev. Ichth. p. 35, 1624; Aldrov. De Pisc. iii, cap. 21, p. 332, 1638; Olearius, Gottor. Kunst-Kammer, pp. 2, 37, tab. 23, fig. 3 (faulty).

*Xiphias gladius*, Linn. Syst. Nat. ed. x, p. 248, 1758 (Europe), after *Xiphias* of Artedi, and ed. xii, p. 432, 1766; Bl. Ichth. iii, p. 23, taf. 76, 1786; Risso. Ichth. Nice, p. 99, 1810, and Eur. Mérid. iii, p. 208, 1827; Fleming, British Anim. p. 220, 1828; Cuv. & Val. viii, p. 255, pl. 225 and 226, 1831 (The **African coast to the Cape**; Quoy & Gaimard have figured one in a collection at **Cape Town**); Yarrell, British Fish. i, p. 164, 1836; Parnell, Fish. Firth of Forth, p. 55, 1838; Demidoff, Voy. Russ. Mérid. iii, p. 393, 1840; Dekay, New York Fauna, Fish. p. 111, 1842; Lowe, Trans. Zool. Soc. iii, 1842, p. 5; Guichen. Explor. Algérie, Poiss. p. 60, 1850; Cuv. Règne Anim. Ill. Poiss. pl. 50, fig. 1, pl. 51, fig. 2 pl. 53, fig. 2, 1850; Bonap. Cat. Met. Pisc. Eur. p. 80, 1850; Lacép. Hist. Nat. Nouv. Ed. pp. 3 and 55, 1855; Günth. Cat. Fish. ii, p.

512, 1860 (European Seas; Western and Northern coasts of Africa; found also on the other side of the Atlantic); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53, name only (**S. Africa**); Casteln. Mém. Poiss. Afr. Austr. p. 42, 1861 (Found, though rare, in **Cape Seas**); Storer, Fish. Mass. p. 71, 1867; Jord. & Gilbert, Synops. p. 420, 1883; Day, British Fish. i, p. 146, pl. xlix, 1884; Philippi, Append. An. Univ. Chile, lxxi, 1887, p. 565; Jord. & Everm. Fish. N. and Mid. Amer. p. 894, 1896 (Atlantic Ocean on both coasts, most abundant between Cuba and Cape Breton; not rare off Cape Cod and the Newfoundland Banks; rather common in Southern Europe; also found in the Pacific, occasionally taken about Santa Barbara Islands); Abbott, Proc. Ac. Nat. Sc. Philad. 1899, p. 346; Delfin, Cat. Peces Chile, p. 52, 1901 (Iquique); Herdm. & Daw. Fish. Irish Sea, in Lancashire Sea Fish. Mem. no. ii, 1902, p. 39 (Scandinavian seas to tropical Atlantic and West Indies. In summer and autumn it appears round the shores of Great Britain, especially in the South and West); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 123 (**South Africa**); Jord. & Everm. Fish. Hawaiian Islds. in Bull. U. S. Fish. Comm. xxiii, pt. 1, 1903 (1905), p. 168 and fig. (Hilo; Honolulu); Jord. & Seale, Fish. Samoa, p. 229, 1906 (Hawaii); Waite, Rec. Canterbury Mus. New Zealand, i, no. 1, p. 25, 1907; Jord. Tan. & Snyd. Cat. Fish. Japan, p. 126, 1913 (Atlantic Ocean on both coasts; Hawaii; Japan; California).

*Sicilian Sword-fish*, Pennant, British Zool. iii, p. 216, pl. 30, 1769; Knox, Edinb. Journ. Nat. & Geol. Sci. ii, p. 427. *Xiphias rondeletii*, Leach, Werner Mem. ii, p. 58, pl. 2, fig. 1, 1818 (Firth of Forth), and Zool. Misc. i, p. 62, pl. 27. *Skeleton*, Rosenth. Ichthyot. Taf. t. 21, 1839; Cuv. & Val. ix, pl. 231, 1833.

### FAMILY CORYPHAEINIDAE.

#### *Coryphaena*, Linn.

*Coryphaena*, Linn. Syst. Nat. ed. x, p. 261, 1758; (Artedi) Cuv. & Val. Hist. Nat. Poiss. ix, p. 268, 1833; Günth. Cat. Fish. ii, p. 404, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 951, 1896; Goode & Bean, Ocean. Ichth. p. 209, 1896.

*Caranxomorus*, Lacép. Hist. Nat. Poiss. iii, p. 26, 1802.

*Lepimphis*, Rafinesque, Caratteri di alcuni nuovi generi, p. 33, 1810.

*Lampugus*, Cuv. & Val. t.c.p. 317; Gill, Proc. Ac. Nat. Sc. Philad. 1802, p. 127.

**Coryphaena hippurus**, Linn.

(Common Dolphin).

*Hippurus*, Rondel. De Pisc. viii, cap. 19, p. 255, 1554; Gesner, Hist. Anim. pp. 423 and 501, 1558; Aldrov. De Pisc. iii, cap. 17, p. 306, 1638; Jonston, De Pisc. i, t. 1, cap. 1, art. 6, tab. 1, fig. 12, 1649; Willughby, p. 213, pl. 01, fig. 5, 1686; Ray, Synops. p. 100, 1713.

*Coryphaena no.* 1, Artedi, Gen. Pisc. p. 15, 1738; Brown, Civ. & Nat. Hist. Jamaica, p. 443, 1756.

*Coryphaena hippurus*, Linn. Syst. Nat. ed. x, p. 261, 1758 (open seas), and ed. xii, p. 446, 1766; Osbeck, Reise nach China, p. 403, 1765; Bl. Ichth. tab. 174, 1797; Bl. Schn. Syst. Ichth. p. 295, 1801; Lacép. Hist. Nat. Poiss. iii, pp. 173 and 178, 1802 (Pacific; Atlantic; Mediterranean); Shaw, Zool. iv, p. 212, pl. 32, fig. 1, 1803; Risso, Ichth. Nice, p. 178, 1810, and Eur. Mérid. iii, p. 339, 1827; Mitchell, Trans. Lit. & Phil. Soc. New York, p. 378, 1815; Cuv. & Val. ix, p. 278, pl. 266, 1833 (Mediterranean); Guichen. Explor. Sc. Algérie, Poiss. p. 63, 1850; Lowe, Trans. Zool. Soc. ii, p. 183, iii, p. 6, and Proc. Zool. Soc. 1839, p. 80; Bonap. Fauna Ital. Pesc., cum fig. (juv.) 1841; Günth. Cat. Fish. ii, p. 405, 1860 (**Cape Seas**; Ile de France; Madeira), and Fische Südsee, v, p. 146, 1876 (Indian Océan); Playfr. Fish. Zanz. p. 66, 1866 (Zanzibar); Steindr. Sitz. Ak. Wiss. 1868, p. 370; Klunz. Verh. Zool.-bot. Ges. Wien, 1871, p. 446; Day, Fish. Ind. p. 248, pl. liii, 1876 (Madras); Jord. & Gilb. Synops. p. 914, 1833; Jord. & Everm. Fish. N. and Mid. Amer. p. 952, 1896 (Pelagic, north on American coast to Cape Cod; abundant from S. Carolina to Texas; not definitely known from the Eastern Pacific); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 129 (**S. Africa**); Jord. & Snyder, Hawaiian Fish. in Bull. U. S. Fish. Comm. xxiii, pt. 1, 1903 (1905) p. 204 and fig. (Honolulu; Hilo); Jord. & Seale, Fish. Samoa, p. 235, 1906 (Hawaii; warm seas); Jord. Tan & Snyd. Cat. Fish. Japan, p. 132, 1913 (Hawaii; South Seas; East Indies; Japan); Pellegr. Ann. Inst. Oceanogr. Poiss. t. vi, fasc. iv, 1914, p. 72 (coasts of Mauritius; pelagic).

*Scomber pelagicus*, Linn. Syst. Nat. ed. x, p. 299, 1758 (no locality stated).

*Coryphaena fasciolata*, Pallas, Spicil. Zool. viii, pl. 3, fig. 2, 1772 (Amboina); Blkr. Visch. v. d. Kaap, pp. 54 and 67, 1860 (South Atlantic); Gilchr. Cat. Fish. t.c.p. 1902, p. 129 (**S. Africa**).

*Coryphaena chrysurus*, Lacép. Hist. Nat. Poiss. ii, pl. 18, fig. 2, 1800, and iii, p. 186, 1802 (Pacific Ocean); Cuv. & Val. ix, p. 309, 1833 (East Indies; Pacific Ocean).

*Coryphaena imperialis*, Rafinesque, Caratteri di alc. nuovi gen. Sicil. p. 33, 1810 (Sicily).

*Lepinopha hispidooides*, Rafinesque, t.c.p. 34, 1810 (Palermo).  
*Coryphaena immaculata*, Agassiz in Spix, Pisc. Bras. iii, pl. 56, 1829 (Atlantic, off Brazil).  
*Coryphaena marcgravii*, Cuv. & Val. ix, p. 301, 1833 (South America).  
*Coryphaena sueurii*, Cuv. & Val. t.c.p. 302 (Philadelphia).  
*Coryphaena dorado*, Cuv. & Val. t.c.p. 303 (Brazil); Cuv. Régne Anim. Ill. Poiss. pl. 65, fig. 1, 1850.  
*Coryphaena dolfin*, Cuv. & Val. t.c.p. 305 (Antilles).  
*Coryphaena virgata*, Cuv. & Val. t.c.p. 308 (Martinique), after Plumier.  
*Coryphaena argyrurus*, Cuv. & Val. t.c.p. 314 (Sea of Coromandel).  
*Coryphaena vlamingii*, Cuv. & Val. t.c.p. 315 (Seas of India), after Renard.  
*Coryphaena scomberoides*, Cuv. & Val. t.c.p. 315 (South Seas), after *Ostroglossus* of Commerson.  
*Lampugus pelagica*, and ? *immaculatus*, Cuv. & Val. t.c.p. 318, 329 (immature).  
*Lampugus siculus*, Cuv. & Val. t.c.p. 323 (Sicily).  
*Lampugus fasciolatus*, Cuv. & Val. t.c.p. 328 (Amboina).  
*Coryphaena japonica*, Schleg. Faun. Japan, Poiss. p. 120, pl. 64, 1845 (Nagasaki).  
*Coryphaena sueuri*, Jord. & Gilb. Synops. p. 455, 1883.

### FAMILY BRAMIDAE.

#### **Brama**, Bl. Schn.

*Brama*, Block & Schneider, Syst. Ichth. p. 98, 1801; (Schneid.) Risso, Eur. Mér. iii, p. 433, 1827; Cuv. & Val. Hist. Nat. Poiss. viii, p. 281, 1831; Günth. Cat. Fish. ii, p. 408, 1860; Jord. & Everm. Fish. N. and Mid. Amer. p. 958, 1896.  
*Lepodus*, Rafinesque, Caratteri di alcuni nuovi generi Sicilia, p. 53, 1810.

#### **Brama raii**, Bl.

(Bull-eye; Glass-eye or Bully, of East London).  
*Brama marina cauda forcipata*, Willughby, tab. 5, fig. 12, 1686; Ray, Synops. p. 115, 1713 (Middelburg); Pennant, British Zool. ii, pl. 43, 1769; Duhamel, Peches, iii, p. 26, pl. 6, fig. 1, 1777.  
*Sparus raii*, Bl. Ichth. taf. 273, 1791, after Ray etc.; Shaw, Zool. iv, p. 404, 1803; Donovan, British Fish. ii, pl. 37, 1808.  
*Brama raii*, Bl. Schn. Syst. Ichth. p. 99, 1801; Risso, Ichth. Nice, p. 248, 1810 and Eur. Mér. iii, p. 433, 1827; Cuv. & Val. vii, p. 281, pl. 190, 1831 (Mediterranean); Parnell, Fish. Firth of Forth, p. 49, 1838; Yarrell, British Fish. 2nd ed. i, p. 133, 1841, and 3rd ed. ii, p. 165, 1859; Lowe,

Trans. Zool. Soc. iii, 1842, p. 8; Guich. Explor. Sc. Algérie, Poiss. p. 56, 1850; Valenc. in Cuv. Régne Anim. Ill. Poiss. pl. 26, fig. 1, 1850 (Chile), after Gay's type; Günth. Cat. Fish. ii, p. 408, 1860 (**Cape Seas**; Mediterranean; Madeira; British coasts), and *Challenger*, Shore Fish. p. 66, (name only) 1880 (Off Inosima, Japan); Lutken, Spolia Atlantica, 1880; Jord. & Gilb. Synops. p. 915, 1883; Smitt, Scandinavian Fish. 2nd p. 77, pl. vi, fig. 1, 1893; Jord. & Everm. Fish. N. and Mid. Amer. p. 959, 1896 (open seas, widely distributed, descending to considerable depths; occasional on the coasts of Europe as far north as the Faroe Islands, rarely taken on American Atlantic coasts; Bermuda; Grand Banks; Pacific coast from Santa Catalina to Puget Sound); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 130 (**S. Africa**); Jord. Tan. & Snyd. Cat. Fish. Japan, p. 134, 1913 (Indian Sea; Chile; Japan).

*Sparus castaneola*, Lacép. Hist. Nat. Poiss. iv, p. 110, 1802 (Atlantic Ocean); Shaw, Gen. Zool. iv, p. 424, 1803, after Lacépède, who copied from Bloch.

*Sparus niger*, Turton, British Fauna, p. 98, 1807 (Swansea).

*Lepodus saragus*, Rafinesque, Caratteri, p. 53, 1810 (Palermo).

*Brama dussumieri*, Cuv. & Val. vii, p. 294, 1831 (Indian Sea, Long. 85° E.).

? *Brama orsini*, Cuv. & Val. t.c.p. 295 (Indian Sea, Long. 85° E. from stomach of *Germo alalunga*).

? *Brama chilensis*, Gay, Hist. Chile, Peces, p. 218, 1843 (Chile).

## FAMILY ZEIDAE.

### **Zeus**, Linn.

Linnaeus, Syst. Nat. ed. x, p. 137, 1758; (Artedi) Cuv. & Val. Hist. Nat. Poiss. x, p. 4, 1835; Günth. Cat. Fish. ii, p. 393, 1860.

### **Zeus capensis**, Cuv. & Val.

(*John Dory*).

Cuv. & Val. x, p. 23, 1835 (**Cape of Good Hope**); Günth. Cat. Fish. ii, p. 394, 1860 (**Cape Seas**); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860, p. 54, name only, (**S. Africa**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 129 (**S. Africa**), and iv, 1908, p. 154 (**Simons Bay**; **False Bay**; **Buffels Bay**; **Cape Point**; **Walker Point**; **Gericke Point**; **Cape Infanta**; **Vondeling Isld.**; **Cape St. Blaize**, 17-50 fthms.).

### **Zeus japonicus**, Cuv. & Val.

*Poisson à Miroir du Japan*, Tilesius, Krusenstern's Reise, Atlas, about 1809, pl. 51, fig. 1 (Japan).

*Zeus japonicus*, Cuv. & Val. x, p. 24, 1835 (on a Japanese drawing); Schleg. Faun. Japon. Poiss. p. 123, pl. lxvia, 1847 (Nagasaki), called *Zeus faber japonicus* on plate; Blkr. Verh. Bat. Gen. xxvi, 1857, p. 105 (Japan); Günth. Cat. Fish. ii, p. 394, 1860 (Sea of Japan), and *Challenger*, Shore Fish. p. 66, name only, 1880 (Market of Yokohama); Nystrom, Svensk. Vet. Ak. Handl. 1887, p. 32 (Nagasaki); Ishikawa, Prel. Cat. p. 43, 1897 (Tokyo; Boshu; Nagasaki); Steindr. Reise, *Aurora*, p. 211, 1898; Jord. & Snyder, Proc. U. S. Nat. Mus. 1900, p. 359 (Tokyo); Jord. & Fowler, Proc. U. S. Nat. Mus. xxv, 1903, p. 517 (Tokyo; Misake; Kobe; Hiroshima; Tsuruga; Nagasaki); Jord. & Starks, Bull. U. S. Fish. Comm. 1902 (1904) p. 565 (Off Ose Point, Suruga Bay, Japan, 50-60 fthms.); Gilchr. Mar. Inv. S. Afr. iv, 1908, p. 154 (Nanquas Peak, East coast Africa, 47 fthms.); Tugela River, 40 fthms.; **Simons Town**; Jord. Tan. & Snyd. Cat. Fish. Japan, p. 207, 1913 (Tokyo to Nagasaki).  
*Zeus japonicus faber*, Schleg. Faun. Japon. Poiss. pl. lxvia, 1847 (Nagasaki).

### FAMILY CYTTIDAE.

#### **Cyttosoma**, Gilchr.

Gilchrist, Marine Invest. S. Africa, iii, 1905, p. 6.

#### **Cyttosoma boops**, Gilchr.

Gilchr. Mar. Inv. S. Afr. iii, 1905, p. 6, pl. xxiii (**Vasco da Gama Peak** (near **Cape Point**) N.  $40^{\circ}$  E.,  $13\frac{1}{2}$  miles, 120 fms.), and iv, 1908, p. 150 (Off **Cape Point** Lighthouse, NE  $\frac{3}{4}$  E., 29 miles, 470 fms.); Holt & Byrne, Ann. and Mag. Nat. Hist. (8) i, 1908, p. 90.

#### **Cyttosoma verrucosum**, Gilchr.

*Oreosoma* sp., Blgr. Comp. Rend. Ac. Sci. Paris, 1903.

? *Oreosoma*, Cuv. & Val. iv, p. 515, pl. 99 (Atlantic Ocean).

*Cyttosoma verrucosum*, Gilchr. Mar. Inv. S. Afr. iv, 1908, p. 151, pl. xl, (Off **Cape Point**, N  $41^{\circ}$  E. 38 miles, 315-400 fms.); Holt & Byrne, Ann. and Mag. Nat. Hist. (8) i, 1908, p. 90.

#### **Neocyttus**, Gilchr.

Gilchrist, Marine Invest. S. Africa, iv, 1908, p. 153; Regan, Trans. Linn. Soc. xii, pt. 3, 1908, p. 231.

#### **Neocyttus rhomboidalis**, Gilchr.

Gilchr. Mar. Inv. S. Afr. iv, 1908, p. 153, pl. xlvi (Off **Cape Point**, N  $41^{\circ}$  E., 38 miles, 315-400 fms.).

**Pseudocytus**, Gilchr.

Gilchrist, Marine Invest. S. Africa, iv, 1908, p. 152.

**Pseudocytus, maculatus**, Gilchr.

Gilchr. Mar. Inv. S. Afr. iv, 1908, p. 153, pl. xli (Off **Cape Point**, N. 41° E., 38 miles, 315-400 fms.).

DIVISION **ZEORHOMBI**.FAMILY **PLEURONECTIDAE**.**Arnoglossus**, Blkr.

Bleeker, Comp. Rend. Acad. Sc. Amsterdam, xiii, 1862, p. 6; Günth. Cat. Fish. iv, p. 415, 1862.

**Arnoglossus capensis**, Blgr.

Bouleng. Mar. Inv. S. Afr. i, 1902, p. 1 (**False Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 145 (**S. Africa**).

**Paralichthodes**, Gilchr.

Gilchrist, Marine Invest. S. Africa, ii, 1904, p. 108.

**Paralichthodes, algoensis**, Gilchr.

Gilchr. Mar. Inv. S. Afr. ii, 1904, p. 108, pl. viii (**Algoa Bay**); Regan, Col. Fish. in Ann. Natal Govt. Mus. 1908, p. 243 (Durban Bay); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 262 (Durban beach).

**Solea**, Cuv.

*Solea*, *Monochir*, et *Archirus*, (Lacép. sp.), Cuv. Régne Anim. 1817.

*Solea*, *Monochir*, *Grammichthys*, *Achirus*, et *Aseraggodes*, Kaup, in Wieg. Archives, 1855, p. 94.

*Solea*, Günth. Cat. Fish. iv, p. 462, 1862; Goode & Bean, Oceanic Ichth. p. 456, 1896.

**Solea bleekeri**, Blgr.

*Pegusa impar*, (non Benn.), Blkr. Versl. Akad. Vet. Amsterd. xv, 1863, p. 458 (**Cape of Good Hope**).

*Solea bleekeri*, Bouleng. Mar. Inv. S. Afr. i, 1902, p. 2 (**Cape of Good Hope**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 145 (**S. Africa**), and iv, 1908, p. 164; Regan, Ann. Durban Mus. 1, pt. 3, 1916, p. 170 (Durban).

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**Solea capensis**, Gilchr.

*Solea (Pegusa) capensis*, Gilchr. Mar. Inv. S. Afr. ii, 1904, p. 110, pl. ix (**False Bay**; off **Cape St. Blaize**, 30 fms.; **Algoa Bay**), and iv, 1908, p. 164.

**Solea cleverleyi**, Gilchr.

Gilchr. Mar. Inv. S. Afr. iv, 1908, p. 160, pl. xlii, and p. 164 (**Walfish Bay**).

**Solea fulvomarginata**, Gilchr.

Gilchr. Mar. Inv. S. Afr. iii, 1905, p. 13, pl. xxxiii (**False Bay**), and iv, 1908, p. 164.

**Soloa turbynei**, Gilchr.

Gilchr. Mar. Inv. S. Afr. iii, 1905, p. 10, pl. xxviii (**Mossel Bay**), and iv, 1908, p. 164; Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 261 (Natal).

**Archirus**, Lacép.

*Achirus*, Lacép. Hist. Nat. Poiss. iv, p. 659, 1802; Cuv. Règne Anim. ed. 2, ii, p. 343, 1829 (restricted to *fasciatus* etc.); Day, Fish. India, p. 427, 1877; Jord. & Everm. Fish. N. and Mid. Amer. p. 2693, 1896.

*Trinectes*, Rafinesque, Atlantic Journ. and Friend of Knowledge, i, 1832.

*Grammichthys*, Kaup, Arch. f. Naturgsch. 1858, p. 94 (*Archirus* being restricted to *Pardachirus barbatus* etc.)

*Monochirus*, Kaup, t.c.p. 94 (not of Rafinesque, 1814, a genus of *Soleinae*).

*Pardachirus*, Günth. Cat. Fish. iv, p. 478, 1862.

*Baiostoma*, Bean, Proc. U. S. Nat. Mus. 1882, p. 413.

*Boeostoma*, Jord. & Gilbert, Synops. p. 965, 1883, amended Orthography.

**Achirus capensis**, Kaup.

*Heteromycteris capensis*, Kaup, Arch. f. Naturg. 1858, p. 103.

*Archirus capensis*, Bouleng. Mar Inv. S. Afr. i, 1902, p. 2 (**False Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 145 (**S. Africa**), and iv, 1908, p. 164.

**Synaptura**, Cantor.

*Synaptura*, Cantor, Cat. Malayan Fish. p. 222, 1849; Günth. Cat. Fish. iv, p. 480, 1862; Day, Fish. India, p. 428, 1877.

*Achiroides*, Bleeker, Verh. Batav. Genootsch. xxiv, 1852, Pleuron. p. 6.

*Synaptura*, *Æsopia*, *Euryglossa*, et *Eurypleura*, Kaup, Wieg. Archiv. 1858.

**Synaptura marginata**, Blgr.

Bouleng. Mar. Inv. S. Africa, i, 1902, p. 11, pl. iii, fig. 1 (**Algoa Bay**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 144 (**S. Africa**), and iv, 1908, p. 164 ; Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 3, 1909, p. 262 (Durban beach).

**Synaptura melanoptera**, Gilchr.

Gilchr. Mar. Inv. S. Afr. iii, 1905 p. 13, pl. xxxii (**Lat. 33° 6' 45" S., Long. 27° 55' 45" E.** 43 fms.), and iv, 1908, p. 164.

**Synaptura microlepis**, Blkr.

Bleeker, Versl. Akad. Vet. Amsterd. xv, 1863, p. 456 (**Cape of Good Hope**) ; Bouleng. Mar. Inv. S. Afr. i, 1902, p. 3 (West coast Africa, **Dassen Isld.**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 144 (**S. Africa**), and iv, 1908, p. 164.

**Synaptura pectoralis**, Kaup.

(*Sole* ; *Tong*).

Kaup, in Wieg. Arch. 1858, p. 96 (**Cape of Good Hope**) ; Günth. Cat. Fish. iv, p. 483, 1862 (**Cape of Good Hope**) ; Bouleng. Mar. Inv. S. Afr. i, 1902, p. 3 (**Cape ; Algoa Bay**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 144 (**S. Africa**), and iv, 1908, p. 164 ; Regan, Col. Fish. in Ann. Natal Govt. Mus. 1908, p. 243 (**Bird Isld.**).

**Synaptura punctatissima**, Peters.

Peters, Monats. Ak. Berlin 1876, p. 249, pl. fig. 2 (Victoria, West Africa) ; Steindr. Ichth. Beitr. x, p. 29 (**Algoa Bay**) ; Pellegr. Ann. Inst. Oceanogr. Poiss. tome vi, fasc. iv, 1914, p. 77 (Nouakschott, Mauritius coast ; Konakry ; Libreville ; **Algoa Bay** ; coasts of Mauritius, Guinea, and Gaboon).

**Cynoglossus**, Ham. Buch.

*Plagusia*, (part). Cuv. Règne Anim. 1817.

*Cynoglossus*, Ham. Buch. Fishes of the Ganges, p. 32, 1822 ; Günth. Cat. Fish. iv, p. 492, 1862 ; Day, Fish. India, p. 481, 1877.

*Archirus*, Ham. Buch. Fish. Ganges, p. 32, 1822.

*Cantoria*, *Trulla*, et *Icania*; Kaup, Wieg. Archiv. 1858, p. 106 etc.

*Arelia*, Kaup, Wieg. Arch. 1858, p. 106 ; Goode & Bean, Oceanic Ichth. p. 462, 1896.

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**Cynoglossus acaudatus**, Gilchr.

Gilchr. Mar. Inv. S. Afr. iv, 1908, p. 162, pl. xlvi, and p. 164 (Amatikula River mouth, 26-27 fms.; one specimen from the mouth of a large fish at Durban; off **Cape Point**, 480-600 fms.).

**Cynoglossus capensis**, Kaup.

(*Sole* ; *Tong*).

*Trulla capensis*, Kaup, in Wieg. Arch. 1858, p. 109.

*Solea vulgaris*, Pappe, Synops. Edib. Fish. C. G. Hope, 1853, or 2nd ed. p. 22, 1866 (**Cape of Good Hope**, not common); Blkr. Visch. v. d. Kaap in Nat. Tijds. Ned. Ind. xxi, 1860 p. 56, name only (**S. Africa**).

*Plagusia capensis*, Casteln. Mém. Poiss. Afr. Austr p. 71, 1861 (Very rare at the **Cape**; found chiefly in August and September).

*Cynoglossus capensis*, Günth. Cat. Fish. iv, p. 503, 1862 (**Cape of Good Hope**); Bouleng. Mar. Inv. S. Afr. i, 1902, p. 4 (Abundant in **Table Bay**; one specimen from near **Dassen Isld.**; **Algoa Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 144 (**S. Africa**), and iv, 1908 p. 164.

**Aphoristia**, Kaup.

*Plagusia* sp., Cuv. Règne Anim. 1817.

*Aphoristia*, Kaup, Wieg. Arch. 1858, p. 106; Günth. Cat. Fish. iv, p. 490, 1862; Jord. & Gilb. Bull. U. S. Nat. Mus. xvi, 1883, p. 842; Goode & Bean, Oceanic Ichth. p. 458, 1896.

**Aphoristia variegata**, Gilchr.

Gilchr. Mar. Inv. S. Afr. ii, 1904, p. 211, pl. xviii (off coast of **East London**, Buffalo River N. 15 miles, 310 fms.), and iv, 1908, p. 164.

DIVISION **GOBIIFORMES**.FAMILY **GOBIIDAE**.**Gobius**, Artedi.

*Gobius*, Artedi, Genera, Pisc. p. 28, 1738; Linn. Syst. Nat. Ed. x, p. 262, 1758; Cuv. & Val. Nat. Hist. Poiss. xii, p. 1, 1837; Günth. Cat. Fish. iii, p. 3, 1861; Jord. & Everm. Fish. N. and Mid. Amer. p. 2210, 1898; Bouleng. Freshw. Fish. Africa, iv, p. 22, 1916.

*Gobius* sp., Cuv. Règne Anim. 1817.

*Chaeturichthys*, Richards. Voy. *Sulphur*, Fish. p. 54, 1845.

*Gobionellus*, Girard, Proc. Acad. Nat. Sc. Philad. 1858, p. 168.

*Ctenogobius*, Gill, Fish. Trinidad, in Ann. Lyc. Nat. Hist. New York, 1858, pp. 374, 430.  
*Chaenogobius*, Gill, Ann. Lyc. Nat. Hist. New York, 1859, p. 12.  
*Lepidogobius*, Gill, t.c.p. 14.  
*Euctenogobius*, Gill, t.c.p. 45.  
*Acanthogobius*, and *Rhinogobius*, Gill, t.c. and Proc. Acad. Nat. Sc. Philad. 1859, p. 145.  
*Oxyurichthys*, Bleeker, Enum. Spec. Pisc. in Act. Soc. Sc. Indo-Neerl. vi, 1859, p. 120, and Esquisse *Gobioides* in Arch. Néer. Sc. Nat. ix, 1874, p. 324.  
*Glossogobius* (Gill), Bleeker, Arch. Néer. Sc. Nat. ix, 1874, p. 315.  
*Awarus*, Bleeker, t.c.p. 320.

**Gobius caffer**, Günth.

Günth. Ann. & Mag. Nat. Hist. (4) xiv, 1874, p. 453 (**Port Elizabeth**) ; Steindr. Ichth. Beitr. x, 1881, p. 32 (**Algoa Bay** ; **Table Bay**).

**Gobius capensis**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 55, 1861 (**Cape Seas**) ; Sauvage, Bull. Soc. Philom. (7) iv, 1880 (redescribed) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 132 (**S. Africa**).

**Gobius gilchristi**, Blgr.

Bouleng. Mar. Inv. S. Afr. i, 1902, p. 8 (**Little Brak River**, **Mossel Bay**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 131 (**South Africa**) ; Bouleng. Freshw. Fish. Africa, Vol. iv, p. 27, 1916 (**Cape of Good Hope**).

**Gobius giuris**, Ham. Buch.

*Gobius Korah-mottah*, *koku*, and *Bullee-Kokah*, Russell, Fish. Vizagapatam, p. 40, pl. 50 ; p. 41, pl. 42 ; p. 42, pl. 53, 1803.

*Gobius giuris*, Ham. Buch. Fish. Ganges, pp. 51 and 366, fig. 15, 1822 (Ganges) ; Cuv. & Val. xii, p. 72, 1837 (Calcutta ; Bengal ; Bombay) ; Blkr. Verh. Bat. Gen. xxii, 1849, Blen. en Gob. p. 24 (Sunda-Molucca Archipelago) ; Günth. Cat. Fish. iii, p. 21, 1861 (Zambezi ; Ceylon ; Madras ; Bengal ; Calcutta ; Sea of Pinang ; Siam Amboyna ; Ceram ; Borneo ; Philippines ; China Seas) ; Kner, *Novara*, Fische, p. 173, 1865 ; Day. Fish. Malabar, p. 109, 1865, and Fish. India, p. 294, pl. xlvi, fig. 1, 1876 (East coast Africa, also in all pieces of fresh water throughout the plains of India, Ceylon, Sind, Burmah, to the Malay Archipelago and beyond) ; Playf. Fish. Zanz. p. 70, 1866 (Zanzibar ; Pangani River) ; Peters, Monats. Akad. Berlin, 1868, p. 263, and Reise n. Mossambique, p. 20, [C.P. 3—1918]

pl. iii, fig. 2, 1868; Vincen. Pesc. Birmania, p. 46, 1890 (Rangoon); Sauvage, Hist. Madagascar, Fish. p. 363, pl. 37, figs. 3 and 3a, 1891; Pfeffer, Ost-afrik. Fische, p. 13, 1893 (Pangani); M. Webb, Zool. Jahr. bd. x, heft 2, 1897, p. 144 (Natal—mouth of Umhloti River; Umbilo River; freshwater pool at Isipingo); Jatzow & Lenz, Fische Ost-afrik. Madag. Aldabra, p. 507, 1898 (S. Juan de José; Zanzibar; Kokotoni etc.); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 13 (**S. Africa**); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, p. 3, 1909, p. 244 (Umgeni Lagoon, Durban); Bouleng. Freshw. Fish. Afr. iv, p. 24, fig. 15, 1916 (coasts and Fresh waters of East and **South Africa**, to India, Southern China and the Malay Archipelago); Regan, Ann. Durban Mus. i, pt. 3, 1916, p. 170 (Natal).

*Gobius Kokius*, Cuv. & Val. xii, p. 68, 1837 (Isle de France; Malabar; Pondicherry); Jacquem. Voy. l'Inde, Poiss. t. xiv, fig. 3, 1844; Jerdon, Madras Journ. Lit. Sc. 1848, p. 148; Blkr. Verh. Bat. Gen. xxii, 1849, p. 24, fig. 3, (Sunda-Molucca Archipelago); Cantor, Cat. Malayan Fish. p. 180, 1849.

*Gobius russelli*, Cuv. & Val. xii, p. 75, 1837 (Pondicherry).

*Gobius catus*, Cuv. & Val. xii, p. 76, 1837 (Pondicherry; Bengal; Malabar; Burmah).

*Gobius kora*, Cuv. & Val. xii, p. 77, 1837 (No locality stated).

*Gobius celebicus*, Cuv. & Val. xii, p. 74, 1837 (Celebes, freshwater); Blkr. Nat. Tijds. Ned. Ind. vii, 1854, p. 318 (Bantam).

*Gobius kurpah*, Sykes, Trans. Zool. Soc. ii, 1841, p. 352, pl. 61, fig. 1.

*Gobius fasciato-punctatus*, Richards. Voy. *Sulphur*, Ichth. p. 145, pl. 62, figs. 13 and 14, 1845.

*Gobius phaiosoma*, Blkr. Verh. Bat. Gen. xxii, 1849, p. 30, Blen. en Gob. (Sunda-Molucca Archipelago), and Nat. Tijds. Ned. Ind. 1851, i, fig. 5.

*Gobius fusiformis*, Blkr. Verh. Bat. Gen. xxii, 1849, p. 30 (Sunda-Molucca Archip.).

*Gobius platycephalus*, Peters, Monats. Akad. Berlin, 1852, p. 681, and Reise n. Mossambique, t. iii, fig. 2, 1868.

*Gobius grandidieri*, Playfr. Proc. Zool. Soc. 1868, p. 10.

*Glossogobius giuris*, Blk. Verh. Ak. Amsterd. xviii, 1879, p. 17 (Mauritius); Smith & Seale, Proc. Biol. Soc. Washington, xix, 1906, p. 79 (Mindanao); Everm. & Seale, Fish. Philippine Islds. p. 104, 1907 (Bacon; San Fabian; Bulan); Jord. & Rich. Fish. Philippine Archip. p. 277, 1908 (Mindoro Isld.; Iloilo; Aparri); Seale, Fish. Hongkong, p. 75, 1914 (Hongkong).

? *Gobius spectabilis*, M. Weber, Zool. Jahr. Syst. x, 1897, p. 144 (Natal-Umgeni River; Umhloti River, near Verulam; Illov. River); Gilchr. t.c.p. 131 (**S. Africa**).

**Gobius nudiceps**, Cuv. & Val.

*Gobius nudiceps*, Cuv. & Val. xii, p. 65, 1837 (**Cape of Good Hope**) ; Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 73 (**Cape of Good Hope**) ; Casteln. Mém. Poiss. Afr. Austr. p. 55, 1861 (**Cape of Good Hope**—July and August) ; Günth. Cat. Fish. iii, p. 13, 1861 (**Cape of Good Hope**) ; Kner, *Novara*, Fische, p. 177, 1865 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 131 (**S. Africa**) ; Bouleng. Freshw. Fish. Africa, iv, p. 28, 1916 (**Cape of Good Hope** ; Illovo River, Natal). *Gobius gymnauchen*, (non Blkr), M. Weber, Zool. Jahr. Syst. x, 1897, p. 144 (Knysna ; Illovo River, Natal) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 132 (**S. Africa**).

**Gobius olivaceus**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 55, 1861 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 131 (**S. Africa**).

DIVISION **DISCOCEPHALI**.FAMILY **ECHENEIDIDAE**.**Echeneis**, (Artedi) Linn.

*Echeneis*, Artedi, Genera Pisc. p. 14, 1738 ; Linn. Syst. Nat. ed. x, p. 260, 1758 ; Günth. Cat. Fish. ii, p. 376, 1860 ; Jord. & Everm. Fish. N. and Mid. Amer. p. 2268, 1898.

*Leptecheneis*, Gill, Proc. Acad. Nat. Sc. Philad. 1864, p. 60 (*naucrates* ; the name *Echeneis* being transferred to *E. remora*, the only species known to Artedi).

**Echeneis clypeata**, Günth.

(*Sucker-fish*).

? Dampier, Voy. New Holland, i, pl. i, fig. 6, 1703.

*Echeneis clypeata*, Günth. Ann. and Mag. Nat. Hist. 1860, p. 401, and Cat. Fish. ii, p. 376, 1860 (**Cape Seas**) ; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 129 (**S. Africa**) ; Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 249, (Durban).

**Echeneis naucrates**, Linn.

(*Remora* ; *Sucker-fish*).

*Echeneis s. Remora*, Aldrov. De Pisc. iii, cap. 22, p. 335, 1638 ; Jonston, Thaumatogr. i, tit. 1, cap. 2, art. 4, fig. 3, and tab. 39, fig. 8 ; Marcgr. Iter. Bras. p. 180, 1648 ; Dutertre, Hist. Gen. Antilles, iii p. 299, fig. opp. p. 222, 1667 ; [C.P. 3—1918]

Willughby, p. 19, tab. G8, fig. 2, 1686; Ray, *Synops. Meth. Pisc.* p. 71, 1713; Ruysch. *Theatr. Univ.* p. 7, tab. 4, fig. 3, and tab. 39, fig. 8, 1718; Brown, *Nat. Hist. Jamaica*, p. 443, 1756; Seba, *Thes. iii*, p. 103, tab. 33, fig. 2, 1758.

*Echeneis neucrates*, Linn. *Syst. Nat.* ed. i, 1735, and ed. x, p. 261, 1758 ("In Pelago Indico"); Hasselg. *Iter. Palest.* p. 324, 1757; *Forsk. Descr. Anim.* p. xvi, no. 7, 1775; Schoepff, *Schrift. Ges. Naturf. Freunde, Berlin*, viii, 3, p. 145, 1788; Gmel. *Linn. Syst. Nat.* p. 1188, 1793; *Bl. Ichth.* ii, p. 131, pl. 171, 1797; *Bl. Schn. Syst. Ichth.* p. 239, 1801; Shaw, *Gen. Zool.* iv, p. 209, 1803; Russell, *Fish, Vizagapatam*, i, p. 39, and *Ala mottah*, pl. 49, 1803; Bennett, *Life of Raffles*, p. 692, 1830; *Blkr. Fish. Madagascar*, p. 98, 1875; Day, *Fish. India*, p. 257, pl. lxvii, fig. 1, 1876 (Red Sea; Seas of India, Malay Archipelago and tropical and temperate seas generally).

*Echeneis naucrates*, (corrected spelling), *Lacép. Hist. Nat. Poiss.* iii, pp. 146 and 162, pl. ix, fig. 2, 1802 (All Seas, especially tropical); *Mitchill, Lit. and Phil. Soc. New York*, i, p. 377, 1815; *Cuv. Règne Anim.* 1817; *Webb. & Berth. Iles Canaries, Poiss.* p. 87, 1836; *Richards. Fauna Bor. Amer.* iii, p. 266, 1836, also in *Ann. and Mag. Nat. Hist.* xi, 1843, p. 498, and *Ichth. China*, p. 203, 1846; *Cantor, Cat. Malayan Fish.* p. 199, 1849; *Temm. & Schleg. Fauna Japon. Poiss.*, p. 270, pl. 120, fig. 1, 1850; *Guichen. Explor. Sc. Algérie, Poiss.* p. 111, 1850; *Günth. Cat. Fish.* ii, p. 384, 1860 (Seas of the temperate and tropical regions), and *Ann. and Mag. Nat. Hist.* 1860, p. 395; *Kner, Novara, Fische*, p. 146, 1865; *Day. Fish. Malabar*, p. 75, 1865, and *Fish. India*, p. 258, 1876 (Seas of temperate and tropical regions); *Playfr. Fish. Zanz.* p. 68, 1866 (Aden; Zanzibar); *Storer, Rept. Fish. Massachusetts*, p. 153, 1867; *Klunz. Verh. Zool.-bot. Ges. Wien*, 1871, p. 446; *Jord. & Gilbert, Synops.* p. 416, 1883; *Sauvage, Grandid. Hist. Madagascar, Poiss.* p. 321, 1891; *Pfeffer, Ost.-afrik. Fische*, p. 12, 1893 (Zanzibar); *Waite, Mem. Australian Mus.* iii, 1897, p. 190 (Funafuti Atoll); *Jatzow & Lenz, Fische Ost.-Afrik. Madag. and Aldabra*, p. 506, 1898 (Aldabra); *Jord. & Everm. Fish. N. and Mid. Amer.* p. 2269, 1898 (warm seas; universally distributed; common north to Cape Cod and occasionally to San Francisco); *Everm. & Marsh, Fish. Porto Rico*, in *Bull. U. S. Fish Comm* xx, 1900, p. 301 and fig. (widely distributed in warm seas; common north of Cape Cod and occasionally to San Francisco, attaching itself to turtles and to large fishes. Very common in the Tropics, being found attached to sharks, groupers, or any other large fish, without regard to species. Few large sharks at Key West without them);

Steindr. Fische Sud.-arab. and Sokotra, p. 23, 1902 (Gischin) Everm. & Seale, Fish. Philippine Islds. p. 104, 1907 (Bulan); Weber, Fische Aru-und-Kei Ins. p. 47, 1911 (Karang Islds.); Gilchr. & Thomp. Ann. S. Afr. Mus. xiii, pt. 3, 1914, p. 79 (Natal); Pellegr. Ann. Inst. Oceanogr., tome vi, fasc. 14, 1914, p. 80 (West coast Africa; temperate and tropical seas; Mediterranean, principally at Nice); Regan, Ann. and Mag. Nat. Hist. (8) xv, 1915, p. 129 (Lagos); Bamber, Journ. Linn. Soc. xxxi, no. 210, 1915, p. 485 (Sudanese Red Sea).

*Echeneis albicauda*, Mitch. Amer. Monthly Mag., ii, p. 244, 1817 (New York).

*Echeneis lunata*, Bancroft, Proc. Zool. Soc. i, 1830, p. 134, and Zool. Journ. v, p. 411, pl. xviii (Kingston, Jamaica).

*Echeneis australis*, Griffith, in Cuv. Anim. Kingd. Fishes, p. 504, 1834; Bennett, Whaling Voy. ii, p. 273, 1840.

*Echeneis vittata*, Rüpp. N. W. Fische, p. 82, 1838 (Red Sea); Lowe, Proc. Zool. Soc. 1839, p. 89 (Madeira), also 1850, p. 252, and Trans. Zool. Soc. iii, 1842, p. 17.

*Echeneis fusca*, Gronov. Syst. ed. Gray, p. 92, 1854 ("In Oceano Americano"),

*Echeneis fasciata*, Gronov. t.c.p. 92 (Mediterranean).

*Echeneis guaiacan*, Poey, Memorias, ii, p. 248, 1861 (Cuba: young).

*Echeneis metallica*, Poey, t.c.p. 252 (Cuba).

*Echeneis verticalis*, Poey, t.c.p. 253 (Cuba: young).

*Leptecheneis naucrates*, Gill, Proc. Acad. Nat. Sc. Philad. 1864, p. 60; Poey, Fauna, Puerto Riquena, p. 331, 1881 (Porto Rico); Jord. & Seale, Fish. Samoa, p. 411, 1906 (Samoa; Hawaii; New Guinea; warm seas generally), and Fish. Luzon and Panay, p. 40, 1907 (Manila); Jord. Tan. & Snyd. Cat. Fish. Japan, p. 310, 1913 (warm seas; universally distributed).

*Skeleton*, Agassiz, Recherches Poiss. Foss. iv. tab. G.

NOTE.—This fish has also been reported from **East London** and from **Roman Rock, False Bay**.

### **Echeneis remora**, Linn.

(*Remora*; *Sucker-fish*; *Lootsman*).

*Echeneis*, Ovid, Halieut. v, p. 99; Pliny, xxxii, cap. 1 and ix, cap. 25; Ælian, i, cap. 36, and ii, cap. 17; Wotton, De Differ. p. 149, 1552.

*Ἐχενίς*, Plutarch, Sympos. lib. ii; Oppian, Halieut. i, p. 9, *Remora*, Rondel, xv, cap. 18, p. 436, 1554; Petiver, Gazophl. tab. 44, fig. 12, 1764.

*Zuiger*, Nieuhoff, Bras. Zee-en-Lant-Reise, ii, p. 274, fig. 67, 1682.

*Remora imperati*, Willughby, Appendix, p. 5, tab. 9, fig. 2, 1686.

[C.P. 3—1918]

*Sucking-fish*, Edwards, Gleanings, no. 210, 1758; Pennant, British Zool. ed. 4, iii, Append. p. 524, 1812.

*Echeneis remora*, Linn. Syst. Nat. ed. i, p. 446, 1735, and ed. x, p. 260, 1758 ("In Pelago Indico"), also, Mus. Reg. Ad. Fred. i, p. 75, 1754, and Amoen. Acad. i, p. 320, 1759; Osbeck, Voy. China, p. 94, 1771; Muller, Prodr. Faun. Dan. no. 361, 1777; Schoepff, Schrift. Ges. Naturf. Freunde Berlin, viii, 3, p. 145, 1788; Gmel. Linn. Syst. Nat. p. 1187, 1793; Bl. Ichth. ii, p. 134, pl. 172, 1797; Bl. Schn. Ichth. p. 240, 1801; Lacép. Hist. Nat. Poiss. iii, pp. 146, 147, pl. 9, fig. 1, 1802 (All Seas); Shaw, Gen. Zool. iv, p. 202, pl. 31, 1803; Turton, British Fauna, p. 94, 1807; Blumenb. Abbild. taf. 78, 1810; Risso, Ichth. Nice p. 177, 1810, and Eur. Mérid. iii, p. 269, 1827; Mitchell, Trans. Lit. and Phil. Soc. New York, i, p. 378, 1815; Cuv. Règne Anim. 1817, Faber, Fische Islds. p. 115, 1829; Richards. Faun. Bor. Amer. p. 265, 1836; Bennett, Whaling Voy. p. 271, 1840; Dekay, New York Faun. Fish. p. 309, 1842; Lowe, Trans. Zool. Soc. iii, 1842, p. 16; Jenyns, Zool. Beagle, Fish. p. 142, 1842; Schleg. Faun. Japon. Poiss. p. 271, 1850; Yarrell, British Fish. 3rd ed. i, p. 670, 1859; Günth. Cat. Fish. ii, p. 378, 1860 (Guernsey; Madeira; **Cape of Good Hope**; India; China Seas; South Sea; Bass Strait), also, Ann. and Mag. Nat. Hist., 1860, p. 390, and *Challenger*, Pelagic Fishes, xxxi, p. 18, 1889 (Sandwich Islds.); Blk. Visch. v. d. Xaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 55, name only (**Cape Seas**), and Poiss. Madagascar, p. 99, 1875; Kner, Novara, Fische, p. 146, 1865; Playfr. Fish. Zanz. p. 68, 1866 (Aden; Zanzibar); Lutken, Vid. Medd. Kjobenh. 1875, p. 38; Jord. & Gilbert, Synops. p. 417, 1883; Day, British Fish. i, p. 108, pl. xxxix, fig. 2, 1884 (Dublin Bay, adhering to the gills of a Blue shark (*Carcharias glaucus*)); Herdm. & Daw. Fish. Irish Sea, in Lanc. Sea-fish. Mem. ii, 1902, p. 38 (Dublin Bay, quoted from Day); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 128 (**South Africa**); Jord. & Everm. Fish. Hawaiian Islds., in Bull. U. S. Fish Comm. xxiii, pt. i, 1903 (1905), p. 494 (Honolulu); Jord. & Seale, Fish. Samoa, p. 411, 1906 (Hawaii); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 248 (Natal); Jord. Tan. & Snyder, Cat. Fish. Japan, p. 311, 1913 (warm seas, north to New York and San Francisco); Bamber, Journ. Linn. Soc. xxxi, Zool. no. 210, 1915, p. 485 (Sudanese Red Sea).

*Echeneis* sp., Klein, Missus iv, p. 51, no. 1, 1742; Gronov. Zoophyl. p. 75, no. 256, 1763, and Mus. Ichthyol. i, no. 33, 1754.

*Styris-fiskr*, Olaf. Reise d. Island, ii, p. 207, 1774.

*Echeneis squalipeta*, Daldorf, Skrft. Naturh. Selsk. ii, p. 157, 1797 (Atlantic Ocean between the Tropics); Bl. Schn. Syst. Ichth. p. 240, 1801; Günth. Cat. Fish. ii, p. 377, 1860 (Atlantic, between the Tropics).

*Echeneis naucrates*, Riso, Eur. Mérid. iii, p. 270, 1827.

*Echeneis jacobaea*, Lowe, Proc. Zool. Soc. 1839, p. 89 (Madeira), and Trans. Zool. Soc. iii, 1842, p. 17.

*Echeneis pallida*, Lowe, Proc. Zool. Soc. 1839, p. 89 (Madeira), and Trans. Zool. Soc. iii, 1842, p. 16 (not Schlegel).

*Echeneis parva*, Gronov. Syst. ed. Gray, p. 92, 1854 (Pacific Ocean).

*Echeneis remoroides*, Blkr. Nat. Tijds. Ned. Ind. ix, 1855, Batoe, ii, p. 70.

*Echeneis postica*, Poey, Memorias, ii, p. 255, 1861 (Havana).

*Remora jacobaea*, Gill, Proc. Acad. Nat. Sc. Philad. 1862, p. 239.

*Remora remora*, Gill, t.c.p. 239; Jordan, Cat. Fish. N. Amer. in Rept. Comm. Fish and Fisheries, 1885 (1887) p. 854; Berg, Ann. Mus. Nac. Buenos-Aires, iv, 1895, p. 73; Jord. & Everm. Fish. N. and Mid. Amer. p. 2271, 1898 (warm seas, New York to San Francisco, where it is not rare; usually found attached to large sharks; very common in the West Indies); Delfin, Cat. Peces, Chile, p. 88, 1901 (both hemispheres); Jord. & Snyd. Fish. Hawaii, in Bull. U. S. Nat. Mus. xxvii, 1904, p. 946 (Honolulu).

## DIVISION **SCLEROPAREI.**

### FAMILY **SCORPAENIDAE.**

#### **Sebastes**, Cuv. & Val.

*Sebastes*, Cuv. & Val. Hist. Nat. Poiss. iv, p. 326, 1829; Cuv. Règne Anim. ed. 2, ii, p. 166, 1829; Günth. Cat. Fish. ii, p. 95, 1860; Goode & Bean, Oceanic Ichth. p. 259, 1896; Jord. & Everm. Fish. N. and Mid. Amer. p. 1760, 1898.

*Eusebastes*, Sauvage, Nouv. Archives Mus. Paris (2), i, 1878, p. 1421.

#### **Sebastes capensis**, Cuv. & Val.

(Jacob Evertsen; Jaco-piver).

Gronov., Zoolphy. no. 293, p. 88, 1763 (**Cape**).

*Scorpaena capensis*, Gmel. Linn. Syst. Nat. iii, p. 1219, 1793 (**Cape**).

*Sebastes capensis*, Cuv. & Val. iv, p. 341, 1829 (**Cape of Good Hope**); Quoy & Gaim. Voy. *Astrolabe*, Poiss. p. 690, pl. 11, fig. 3, 1834; Smith, Ill. Zool. S. Afr. Pisces, pl. 22, fig. 1, 1849 (Seas round the **Cape of Good Hope**); [C.P. 3—1918]

Pappe, Synops. Edib. Fish. C. G. Hope, p. 14, no. 3, 1853, 2nd and ed. p. 10, 1866 (**Jacob Evertsen**; common in **Table Bay** almost at all seasons); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, name only p. 52 (**Cape of Good Hope**); Casteln. Mém. Poiss. Afr. Austr., p. 6, 1861 (**Jacob Evertsen**; **Jacob Piver**; very common in the **Cape market**); Günth. Cat. Fish. ii, p. 96, 1860 (**Cape Seas**); Steindr. Ichth. Beitr. x. 1881, p. 38, =*S. maculatus*, Smith (**Cape Town**; **Port Elizabeth**); Gilchrist, Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 118 (**S. Africa**); Regan, Antarctic Fish. in Trans. Roy. Soc. Edinb. xlix, pt. ii, no. 2, 1913, p. 140 (Gough Isl., also found at **Cape of Good Hope**).  
 ? *Sebastes maculatus*, Smith, t.c.pl. 22, fig. 2, 1849 (not Cuv. & Val. or Richards).  
*Perca atra*, Gronov. Syst. ed. Gray, p. 113, 1854 (Seas round **Cape of Good Hope**).  
*Sebastichthys capensis*, Sauvage, Madagascar, Poiss. p. 289, 1891.

### **Sebastes maculatus**, Cuv. & Val.

(*Sancord*).

*Sebastes maculatus*, Cuv. & Val. iv, p. 343, 1829 (Mediterranean), not Smith; Pappe, Synops. Edib. Fsh. C. G. Hope, ed. i, 1853, and ed. ii, 1866 (*Sancord*; not very common; caught chiefly in winter; **Cape Seas**); Günth. Cat. Fish. ii, p. 101, 1860 (**Cape Seas**); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned Ind. xxi, 1860, p. 52, name only, 1860 (**Cape of Good Hope**); Casteln. Mém. Poiss. Afr. Austr. p. 7, 1861 (**Cape Seas**; common in market, especially during winter—June, July and August); Gilchr. Cat. Fish. id Mar. Inv. S. Afr. i, 1902, p. 119 (**S. Africa**).

### **Pterois**, Cuv.

*Pseudomonopterus*, *Pseudopterus*, Klein, Missus v, Pisces, p. 76, 1756 (non-binomial).

*Les Pterois*, Cuv. Règne Anim. 1st ed. p. 286, 1817.

*Pterois*, Oken, Isis 1817, p. 1182; Cuv. & Val. Hist. Nat. Poiss. iv, p. 351, 1829; Günth. Cat. Fish. ii, p. 122, 1860; Jord. Tan. & Snyder, Cat. Fish. Japan, p. 244, 1913.

*Macrochirus*, *Pteroleptus*, *Pteropterus*, Swainson, Nat. Hist. Classfn. Anim. ii, p. 264, 1839.

### **Pterois volitans**, Linn.

*Amboynese-visch*, Nieuhoff, Bras. Zee-en-Lant Reise, p. 268, 1682 (Brazil).

*Gasterosteus volitans*, Linn. Syst. Nat. ed. x, p. 296, 1758, and ed. xii, p. 491, 1766 (Amboyna).

*Perca* *sp.*, Gronov. Zoophyl., no. 294, 1763.

*Scorpaena volitans*, Gmel. Linn. Syst. Nat. p. 1217, 1793; Bl. Ichth. tab. 184, 1797; Bl. Schn. Syst. Ichth. p. 193, 1801; Lacép. Hist. Nat. Poiss. ii, tab. 17, fig. 3, 1800, and iii, p. 290, 1802 (Rivers of Japan and Amboyna); Bennett, Fish. Ceylon, pl. 1, 1830; Gronov. Syst. ed. Gray, p. 119, 1854 (Sea of Amboyna).

*Scorpaena mahe*, Lacép. t.c.p. 278, 1802 (Mahé, Seychelles).

*Pterois volitans*, Cuv. & Val. iv, p. 352, pl. 88, 1829 (Red Sea; Isle de France; Isle de Bourbon; Seychelles; Pondicherry; Indian Seas; Molucca; Amboyna); Rüpp. N. W. Fische, p. 107, 1838; Swainson, Fishes, ii, p. 264, 1839; Blkr. Verh. Bat. Gen. xxii, 1849, Sclerop. p. 8 (Sunda-Molucca Archipelago); Günth. Cat. Fish. ii, p. 122, 1860 (Egypt; **Cape of Good Hope**; **South Africa**; Madras; China; Amboyna; Cape Upstart; Sydney; Australia). and Fische Südsee, p. 81, 1874; Day, Fish. Malabar, p. 38, 1865, and Fish. India, p. 154, pl. xxxvii, fig. 1, 1875 (Red Sea; East coast Africa, through seas of India to Australia); Playfr. Fish. Zanz. p. 48, 1866 (Zanzibar); Klunz. Verh. Zool.-bot. Ges. Wien, 1870, p. 806; Pfeffer, Ost-Afrik. Fische, p. 10, 1893 (no locality stated); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 119 (**S. Africa**); Jord. & Seale, Fish. Samoa, p. 379, 1906 (Samoa; Tahiti; Palau; New Guinea; New Britain; East Indies); Everm. & Seale, Fish. Philippine Islds. p. 103, 1907 (Bacon); Regan, Col. Fish., in Ann. Natal Govt. Mus. 1908, p. 247 (Kosi Bay), and Trans. Linn. Soc. xii, pt. 3, 1908, p. 236 (Maldives; Cargados Carajós, 20–30 fms.).

*Pterois à nageoires lie de vin*, Lienard, Nat. Hist. Soc. Mauritius, 1839, p. 33.

*Pseudomonopterus volitans*, Blkr. Madagascar Poiss. p. 87, 1875.

*Pseudomonopterus* (*Pterois*) *volitans*, Blkr. Atlas ix, pl. cccxii, fig. 3, 1877.

### Tetrapoge, Günth.

*Apistus* *sp.*, Cuv. & Val. Hist. Nat. Poiss. iv, p. 391, 1829.

*Tetrapoge*, Günth. Cat. Fish. ii, pp. 131 and 132, 1860.

### Tetrapoge gymnoderma, Gilchr.

Gilchrist, Mar. Inv. S. Afr. iv, 1908, p. 147, pl. xxxvii (off **Bakoven Rock** and **Zwart Klip**, **Cape Peninsula**, 9–24 fms.; **False Bay**, 5–23 fms.; **False Isld.**, 49 fms.; **Bird Islds.** Lighthouse, 57–59 fms.; **Great Fish Point** Lighthouse, 30 fms.; **Cape St. Blaize**, 39 fms.).

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**Agriopus**, Cuv. & Val.

*Agriopus*, Cuv. & Val. Hist. Nat. Poiss. iv, p. 380, 1829; Günth. Cat. Fish. ii, p. 137, 1860.

*Cephalinus*, Gronov. Syst. ed. Gray, p. 159, 1854.

**Agriopus multidentatus**, Cast.

Casteln. Mém. Poiss. Afr. Austr. p. 7, 1861 (rare at the **Cape**; sometimes found in **Table Bay** and **Simons Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 120 (**S. Africa**).

**Agriopus spinifer**, Smith.

*Agriopus spinifer*, Smith, Ill. Zool. S. Afr. Pisces, pl. 3, 1849 (occasionally caught in **Table Bay**, but by no means so frequently as *A. torous* or *A. verrucosus*); Günth. Cat. Fish. ii, p. 138, 1860 (**Cape of Good Hope**); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, name only, p. 52 (**Cape of Good Hope**); Casteln. Mém. Poiss. Afr. Austr. p. 8, name only, 1861 (rare at the **Cape of Good Hope**; found sometimes in **Table Bay** and also at **Simons Bay**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 120 (**S. Africa**); Regan, Col. Fish. in Ann. Natal Govt. Mus. 1908, p. 247 (Kosi Bay).

*Cephalinus granulatus*, Gronov. Syst. ed. Gray, p. 161, 1854 (Indian Ocean).

**Agriopus torvus**, Gronov.

(*Horse-fish*; *Paarde-visch*).

*Blennius torvus*, Gronov. Act. Basil. vii, p. 47, tab. 3, fig. 2.

*Coryphaena torvus*, Bl. Schn. Syst. Ichth. p. 298, 1801.

*Agriopus torvus*, Cuv. & Val. iv, p. 382, 1829 (*See-paard*; **Cape of Good Hope**); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53 (**Cape of Good Hope**); name only; Günth. Cat. Fish. ii, p. 137, 1860 (**Cape Seas**); Casteln. Mém. Poiss. Afr. Austr. p. 7, 1861 (**Cape Seas**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 119 (**S. Africa**).

*Cephalinus glaber*, Gronov. Syst. de. Gray, p. 159, 1854 (Indian Seas).

**Agriopus verrucosus**, Cuv. & Val.

Cuv. & Val. iv, p. 387, pl. 91, 1829 (**Cape of Good Hope**); Blkr. Visch. v. d. Kaap, in Nat. Tijds. Ned. Ind. xxi, 1860, p. 53, name only (**Cape of Good Hope**); Günth. Cat. Fish. ii, p. 138, 1860 (**Cape of Good Hope**); Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 119 (**S. Africa**).

## FAMILY COTTIDAE.

**Cottunculus**, Collett.

Collett, Norges Fiske, p. 20, 1875; Jord. & Everm. Fish. N. and Mid. Amer. p. 1992, 1898; Jord. Tan. & Snyder, Cat. Fish. Japan, in Journ. Coll. Sc. Tokyo, xxxiii, 1913, p. 271.

**Cottunculus macrocephalus**, Gilchr.

Gilchrist, Mar. Inv. S. Afr. iii, 1905, p. 7, pl. xxiv (off **Lion's Head, Cape Peninsula**, 230 fms.; off **South Head**, 190 fms.), and iv, 1908, p. 149, pl. xxxix (off **Cape Point**, 310-560 fms.).

**Cuttunculus spinosus**, Gilchr.

Gilchrist, Mar. Inv. S. Afr. iv, p. 149, pl. xxxviii (off **Cape Point**, about 800 fms.).

## FAMILY CYCLOPTERIDAE.

**Paraliparis**, Collett.

*Paraliparis*, Collett, Vid. Selsk. Forh. Christiania, no. 14, 32, 1878; Günth. *Challenger*, Deep Sea Fishes, in Reports, Zoology xxii, 1887, p. 68; Garman (part), Discoboli, p. 80, 1892; Goode & Bean, Oceanic Ichth. p. 278, 1896; Jord. & Everm. Fish. N. and Mid. Amer. p. 2139, 1898.

*Hilgendorfia*, Goode & Bean, t.c.p. 280.

*Amitrichthys*, Jord. & Everm. Check List Fishes, p. 453, 1896.

**Paraliparis australis**, Gilchr.

Gilchrist, Mar. Inv. S. Afr. ii, 1904, p. 107, pl. vii, (40 miles W. by N. of **Table Mountain**, 300 fms.).

## FAMILY PLATYCEPHALIDAE.

**Platycephalus**, Bl.

*Platycephalus*, Bloch, Ichth. xii, p. 90, 1795; Bl. Schn. Syst. Ichth. p. 58, 1801; Cuv. & Val. Hist. Nat. Poiss. iv, p. 226, 1829; Günth. Cat. Fish. ii, p. 176, 1860.

*Calliomorus*, Lacép. Hist. Nat. Poiss. ii, p. 343, 1800; Jord. Tan. & Snyder, Cat. Fish. Japan, p. 284, 1913.

**Platycephalus insidiator**, Forsk.

(Sand-fish).

*Cottus insidiator*, Forsk. Descr. Anim. p. 25, 1775 (Red Sea); Gmel. Linn. Syst. Nat. p. 1213, 1793; Shaw, Gen. Zool. I4, p. 260, 1803.

*Callionymus indicus*, Gmel. t.c.p. 1153; Russell, Fish. Vizagapatam, ii, p. 36, and *Irrwa*, pl. xlvi, 1803.

*Cottus spatula*, Bl. Ichth. pl. 424, 1797.

*Calliomorus indicus*, Lacép. Hist. Nat. Poiss. ii, p. 343, 1800 (Asia).

*Platycephalus insidiator*, Bl. Schn. Syst. Ichth. p. 59, 1801; Cuv. & Val. iv, p. 227, 1829 (Red Sea; Pondicherry; Moluccas); Rüpp. N. W. Fische, p. 102, 1838; Temm. & Schleg. Fauna Japon. Poiss. p. 39, pl. 15, fig. 1, 1843; Richards. Ichth. China, p. 216, 1846; Blkr. Verh. Bat. Gen. xxii, 1849, Sclerop. p. 6 (Sunda-Molucca Archipelago); Cantor, Cat. Malayan Fish. p. 37, 1849; Jerdon, Madras Journ. Lit. Sc. 1851, p. 142; Günth. Cat. Fish. ii, p. 177, 1860 (**Cape of Good Hope**; Natal; Red Sea; Ceylon; Calcutta; Ganges; China; Japan; Malay Peninsula; Amboyna; Moluccas; Australia); and *Challenger*, Shore Fishes, name only, pp. 33, 41, 55 and 66, 1880 (River Mary, Queensland; Somerset; Hongkong; Yokohama Bay; Inland Sea, Japan); Kner, *Novara*, Fische, p. 121, 1865; Day, Fish. Malabar, p. 43, 1865, and Fish. India, p. 276, 1876 (Red Sea; East coast Africa; Seas of India to Malay Archipelago and beyond); Playf. Fish. Zanz. p. 49, 1866 (Aden; Zanzibar); Klunz. Verh. Zool.-bot. Ges. Wien, 1870, p. 815; Gilchr. Cat. Fish. in Mar. Inv. S. Afr. i, 1902, p. 120 (**S. Africa**); Everm. & Seale, Fish. Philippine Islds. p. 103, 1907 (San Fabian); Jord. & Seale, Fish. Luzon and Pannay, p. 38, 1907 (Cavite); Regan, Cat. Fish. in Ann. Natal Govt. Mus. 1908, p. 247 (Kosi Bay); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 2, 1908, p. 194 (Durban); Seale, Fish. Hongkong, in Philippine Journ. Science, ix, no. 1, sec. D., 1914, p. 77 (common in Hongkong markets).

*Batrachus indicus*, Bl. Schn. t.c.p. 43.

*Platycephalus spatula*, Bl. Schn. t.c.p. 59.

*Cottus madagascariensis*, Lacép. Hist. Nat. Poiss. iii, p. 248, pl. xi, fig. 12, 1802 (Fort Dauphin, Madagascar); Shaw, Zool. iv, p. 261, pl. 37, 1803.

*Calliomorus chaca*, Ham. Buch. Fish. Ganges, pp. 133 and 373, 1822.

*Platycephalus endrachtensis*, Quoy & Gaim. Voy. Freyc. Zool. p. 353, 1824; Cuv. & Val. iv, p. 240, 1829.

*Platycephalus chaca*, Gray, & Hardw. Indian Zool. ii, pl. 93, fig. 2, 1834.

? *Platycephalus cultellatus*, Richards. Ichth. China, p. 217, 1846 (China Sea).

## FAMILY TRIGLIDAE.

## Trigla, Artedi.

*Trigla*, Artedi, Gen. Pisc. p. 42, 1738; Linn. Syst. Nat. ed. x, p. 300, 1758; Cuv. Règne Anim. ed. 1, 1817, ii, p. 301. and ed. 2, 1829, ii, p. 158; Cuv. & Val. Nat. Hist. Poiss. iv, p. 9, 1829; Günth. Cat. Fish. ii, p. 198, 1860; Goode & Bean, Ocean. Ichth. p. 463, 1896.

*Chelidonichthys*, Kaup, Archiv. f. Naturgeschichte, 1873, p. 87.

## Trigla capensis, Cuv. &amp; Val.

(Red Gurnard; Roode Knorhaan).

Cuv. & Val. iv. p. 55, 1829 (**Cape**); Pappe, Synops. ed. 1, 1853, or ed. 2, p. 9, 1866 (Roode Knorhaan, Red Gurnard of the Colonists. Caught in summer with the hook, but not very common in **Table Bay**); Blkr. Visch. v. d. Kaap, p. 53, name only, 1860 (**S. Africa**); Günth. Cat. Fish. ii, p. 203, 1860 (**Cape Seas**); Cast. Mem. p. 5, 1861 (*T. capensis*, the male, known in the **Cape market** as the Red Gurnard; *T. peronii*, the female, known as the Grey Gurnard: common in July, August and September); Kner, *Novara*, Fische, p. 124, 1865; Gilchr. Cat. Fish. 1902, p. 121 (**S. Africa**); Regan, Col. Fish. 1908, p. 247 (**Bird Isld.**); Gilchr. & Thomp. Ann. S. A. Mus. xiii, pt. 3, 1914, p. 77, (Inner Harbour, Durban; off Tugela River).

## Trigla kumu, Less.

*Trigla kumu*, Lesson & Garn. Voy. *Coquille*, Poiss. p. 214, pl. 19, 1825. (New Zealand, "le grand Baie des Iles") Cuv. & Val. iv, p. 50, 1829; Jenyns, Voy. *Beagle*, Fish. p. 27, 1842; Schleg. Faun. Japon. Poiss. p. 37, pl. 14A, fig. 3, 1843; Owen, Osteol. Cat. 1, p. 55, 1853; Blkr. Verh. But. Grn. xxvi, 1854, Japan, p. 74; and Visch v. d. Kaap, p. 53; name only, 1860 (**S. Africa**); Günth. Cat. Fish. iv, p. 204, 1860 (New Zealand; Australia); Kner, *Novara*, Fische, p. 124, taf. vi, fig. 2 (**Cape**); Gilchr. Cat. Fish. 1902, p. 121 (**S. Africa**); Regan, *Terra Nova* Exped. Fishes, p. 21, 1914 (Cape North, New Zealand).

*Trigla spinosa*, McClelland, Calcutta Journ. Nat. Hist. iv, p. 396, pl. 22, fig. 2.

*Chelidonichthys kumu*, Jord. & Everm. Rep. U. S. Fish. Comm. for 1895, (1896) p. 488 footnote; Waite, Mem. Austr. Mus. iv, 1899; *Thetis*, Fish. p. 108 (N. S. Wales coast), and Rec. Canterbury Mus. New Zealand, i, no. 1, 1907, Fishes p. 29; Jord. Tom. & Guyd. Cat. Fish. Japan, p. 289, 1913 (Japan, north to Kakodate; China; Australia; New Zealand).

**Trigla peronii**, Cuv. & Val.

(Grey Gurnard ; Graauwe Knorhaan).

*Trigla peronii*, Cuv. & Val. iv, p. 53, 1829 (**Cape**) ; Pappe, Synops. no. 2, 1853 or 2nd ed. p. 9, 1866 (Graauwe or bruine Knorhaan ; Grey Gurnard, not often caught in **Table Bay**) ; Bilkr. Visch. v. d. Kaap, pp. 53 and 64, 1860 (**S. Africa**) ; Gilchr. Cat. Fish. 1902, p. 120 (**S. Africa**) ; Gilchr. & Thomp. Ann. S. A. Mus. xiii, pt. 3, 1914, p. 77 (Inner Harbour, Durban ; off Tugela River).

*Trigla capensis*, Cast. Mem. p. 5, 1861 (Graauwe Knorhaan, Grey Gurnard, the female form ; according to Casteln. the Red Gurnard is the male form. Common in the months of July, August and September).

**Prionotus**, Lacép.

*Prionotus*, Lacép. Hist. Nat. Poiss. iii, p. 37, 1802 ; Cuv. & Val. Hist. Nat. Poiss. iv, p. 85, 1829 ; Günth. Cat. Fish. ii, p. 191, 1860 ; Jord. & Everm. Fish. N. and Mid. Amer. p. 2148, 1898.

*Omichthys*, Swainson, Nat. Hist. Class'n Fishes, ii, p. 262, 1839.

*Chriolax*, Jord. & Gilbert, Proc. U. S. Nat. Mus. 1878, p. 374.

*Gurnardus*, Jord. & Everm., new sub-genus—t.c.p. 2148, 1898.

*Merulinus*, Jord. & Everm., new sub-genus—t.c.p. 2148, 1898.

**Prionotus pusillus**, Cast.

Casteln. Mem. p. 6, 1861 (**Table Bay**, during summer. February) ; Gilchr. Cat. Fish. 1902, p. 120 (**S. Africa**).

DIVISION **JUGULARES**.FAMILY **TRACHINIDAE**.**Trachinus**, Artedi.

Artedi, Genera, 1738 and in Cuv. Règne Anim. 1817 ; Cuv. & Val. iii, p. 233, 1829 ; Günth. Cat. Fish. ii, p. 233, 1860.

**Trachinus draco**, Linn.

Λράκων, Aristotle, viii, cap. 13 ; Ἀelian, ii, cap. 50, A.D. 120. *Araneus*, Pliny, ix, cap. 48.

*Draco marinus*, Pliny, ix, cap. 27 ; xxxii, cap. ii ; Salvian. f. 71, 1554.

*Draco*, Rondel. x, cap. ii, 1554 ; Aldrov. ii, cap. 50, 1638 ; Willughby, p. 288, 1686 ; Ray, Synops. p. 91, 1713.

*Trachinus* no. 1, Artedi, Pisc. p. 42, 1738 ; Gronov. Zoophyl. no. 274, 1763.

*Trachinus draco*, Linn. Syst. Nat. ed. x, p. 250, 1758; Brünn. Pisc. Mass. no. 30, 1768 (Marseilles); De la Roché, Ann. Mus. xiii, 1809, p. 331; Risso, Ichth. Nice, p. 108, 1810, and Eur. Mér. iii, p. 260, 1827; Martens, Reise nach Venedig, ii, p. 429, 1824; Cuv. & Val. iii, p. 238, 1829; Yarrell, British Fish. i, p. 24, 1836; Fries och Ekstr. Skand. Fisk. p. 13, t. 3, fig. 1, 1836; Nordm. in Drmid. Voy. Russ. Mér. Poiss. p. 370, 1840; Gronov. Syst. ed. Gray, p. 46, 1854 (Mediterranean; Atlantic Ocean); Günth. Cat. Fish. ii, p. 233, 1860 (N. coast Norway; British coast; Mediterranean; Bay of Naples; Europe; Atlantic Ocean; Madeira; Gomara; Lanzarote; Coast of Guinea; **Cape Seas**); Kner, Neue Fische, in Sitz. Ak. Wiss. Wien, 1867; Day, Fish. Grt. Britain i, p. 79, pl. xxx, 1884; Smith, Scandinavian Fish. pl. 4, fig. 3, 1893; Abbott, Proc. Ac. Nat. Sc. Philad. 1899, p. 362; Delfin, Cat. Peces Chile, p. 82, 1901 (Iquique); Herdm. & Daw. Fish. Irish Sea, p. 37, 1902 (Welsh coast; Menai Straits etc.); Gilchr. Cat. Fish. 1902, p. 121 (**S. Africa**).

*Trachinus lineatus*, Bl. Schn. Syst. Ichth. p. 55, tab. 10, 1801.  
*Trachinus major*, Donovan, British Fish. V, pl. 107, 1808.

### FAMILY CALLIONYMIDAE.

#### **Callionymus**, Linn.

*Callionymus*, Linnaeus, Syst. Nat. ed. x, p. 249, 1758; Gill, Proc. Ac. Nat. Sc. Philad. 1859, p. 125; Günth. Cat. Fish. iii, p. 138, 1861; Jord. & Everm. Fish. N. & Mid. Amer. p. 2185, 1898.

*Synchiropus*, Gill, Proc. Ac. Nat. Sc. Philad. 1859, p. 125.

#### **Callionymus costatus**, Blgr.

Bouleng. Mar. Inv. S. Afr. i, 1902, p. 9 (off **Cape St. Blaize**, 40 fms.); Gilchr. Cat. Fish. 1902, p. 132 (**S. Africa**).

### FAMILY GOBIESOCIDAE.

#### **Chorisochismus**, Barnev.

*Gobiesox* sp., Cuv. Règne Anim. 1817.

*Gobiesox*, Müll. & Trosch. Horae. Ichthyol. iii, p. 17, 1845.

*Chorisochismus*, Brisout de Barneville, Revue Zool. 1846, p. 409; Günth. Cat. Fish. iii, p. 490, 1861.

#### **Chorisochismus dentex**, Pall.

(*Klip-zuiger*; *Sucker-fish*.)

*Cyclopterus dentex*, Pallas, Spicil. Zool. vii, p. 6, tab. 1, 1779; Lacép. Hist. Nat. Poiss. ii, p. 64, 1800 (Shores of South America).

*Lepodogaster dentex*, Bl. Schn. Syst. Ichth. p. 2, 1801.

*Gobiesox dentex*, Cuv. Règne Anim. 1817; Müll. & Trosch. Horae Ichth. iii, p. 17, 1845; Blkr. Visch. v. d. Kaap, pp. 55 and 75, 1860 (**Cape of Good Hope**).

*Gobiesox nudus*, Bris. de Barnev. Rev. Zool. 1846, p. 145.

*Chorisochismus nudus*, Bris. de Barnev. t.c.p. 209.

*Gobiesox gyrinus*, Valens. in Cuv. Règne Anim. Ill. Poiss. pl. 108, fig. 1, 1850 (**Cape Seas**).

*Chorisochismus dentex*, Günth. Cat. Fish. iii, p. 490, 1861 (**Table Bay, Cape of Good Hope; Cape Seas**) and *Challenger*, Shore Fishes, p. 14, name only, 1880 (**Simons Bay**); Kner. *Novara*, Fische, p. 237, 1865 (**Cape of Good Hope**); Gilchr. Cat. Fish. 1902, p. 138 (**S. Africa**).

### FAMILY BLENNIIDAE.

#### **Blennius** (Artedi), Linnaeus.

*Blennius*, Artedi, Genera Pisc., p. 27, 1738; Linn. Syst. Nat. Ed. x, p. 256, 1758; Cuv. & Val. Hist. Nat. Poiss. xi, p. 197, 1836; Günth. Cat. Fish. iii, p. 211, 1861; Jord. & Everm. Fish. N. and Mid. Amer. p. 2377, 1898, Blgr. Freshw. Fish. Afr. iv, 1916, p. 108.

*Sularia*, Forskål, Descr. Anim. p. 22, 1775.

*Pholis*, Fleming, British Anim. p. 207, 1828, not *Pholia* Scopoli, 1777; Cuv. & Val. xi, p. 268, 1836.

*Ichthyocoris*, Bonap. Jeon. Faun. Ital. Pesci, 1840.

*Adonis*, Gronov. Syst. ed. Gray, p. 93, 1854.

*Lipophrys*, Gill, American Naturalist, June, 1896, p. 498.

#### **Blennius bifilum**, Günth.

Günth. Cat. Fish. iii, p. 225, 1861 (**Cape Seas**); Gilchr. Cat. Fish. 1902, p. 135 (**South Africa**); Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. ii, 1908, p. 99 (Natal); Regan, Col. Fish. 1908, p. 247 (Kosi Bay).

#### **Blennius capito**, Cuv. & Val.

Cuv. & Val. xi, p. 260, 1836 (**Cape**); Blkr. Visch. v. d. Kaap, p. 55, name only, 1860 (**S. Africa**); Cast. Mem. p. 51, name only, 1861 (**Cape**); Günth. Cat. Fish. iii, p. 215, 1861 (**Cape of Good Hope**); Gilchr. Cat. Fish. 1902, p. 134 (**S. Africa**); Gilchr. & Thomp. Ann. S.A. Mus. vi, pl. 2, 1908, p. 102 (**Cape**).

#### **Blennius castaneus**, Cast.

Casteln. Mem. p. 50, 1861 (**Algoa Bay**); Gilchr. Cat. Fish. 1902, p. 134 (**S. Africa**); Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 102 (quoted).

**Blennius cornutus**, Linn.

(Bijter.)

*Blennius cornutus*, Linn. Mus. Ad. Fried. p. 61, 1754; Amoen. Acad. i, p. 316, 1759; Bl. Schn. Syst. Ichth. p. 169, 1801; Günth. Cat. Fish. iii, p. 213, 1861 (**South coast of Africa**); Gilchr. Cat. Fish. 1902, p. 134 (**S. Africa**); Gilchr. & Thomp. Ann. S.A. Mus. vi, pl. 2, p. 100 (**Kalk Bay**).

*Blennius sp.* Gronov. Zoophyl. no. 264, 1763.

*Blennius grandicornis*, Cuv. & Val. xi, p. 257, 1836; Cast. Mem. p. 51, name only, 1861 (**Cape**).

*Adonis cornutus*, Gronov. Syst. ed. Gray, p. 95, 1854 (Mediterranean; Seas of **Cape of Good Hope**).

*Blennius quadricornis*, Blkr. Visch. v. d. Kaap, p. 55, name only, 1860 (**S. Africa**).

**Blennius cristatus**, Linn.

*Blennius sp.*, Gronov. Mus. i, no. 75, 1756 and Zoophyl. no. 263, tab. 6, fig. 4, 1763; Klein, Pisc. Miss. v, p. 32, no. 3, 1749.

*Blennius cristatus*, Linn. Syst. Nat. ed. x, i, p. 256, 1758 (Indies) after Gronov.; Günth. Cat. Fish. iii, p. 223, 1861 (Ascension Isld.); Jordan, Proc. U.S. Nat. Mus. 1890, p. 329; Jord. & Everm. Fish. N. and Mid. Amer. p. 2382, 1896 (Tropical parts of Atlantic, among rocks, widely diffused and variable. Florida; Abrolhos Islds.; coasts of Brazil); Pellegr. Ann. Inst. Oceanogr. Poiss. tome vi, fasc iv, 1914, p. 85 (Isle Tamara, Guinea; warm parts of the Atlantic; Ascension).

*Blennius crinitus*, Cuv. & Val. xi, p. 237, 1836 (La Rochelle, France); Guich. Explor. Algér. Poiss. p. 72, 1850; Günth. Cat. Fish. t.c.pp. 224 and 561, 1861 (Pernambuco; **Cape Seas**); Gilchr. Cat. Fish. 1902, p. 134 (**S. Africa**); Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908.

*Blennius nuchifilis*, Cuv. & Val. xi, p. 253, 1836 (Ascension Isld.).

*Blennius asterias*, Goodé & Bean, Proc. U.S. Nat. Mus. 1882, p. 416 (Florida; Tortugas); Jord. & Gilbert, Synops. p. 961, 1883.

*Adonis cristatus*, Gronov. Syst. ed. Gray, p. 95, 1854 (Atlantic Ocean).

**Blennius ocellatus**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 103 (**False Bay**).

**Blennius scullyi**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 103 (Walvisch Bay); Regan Ann. Durban Mus. i, pt. 3, 1916, p. 170 (Durban).

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**Salarias**, Cuv.

Cuvier, Règne Anim. ii, p. 251, 1817; Cuv. & Val. Hist. Nat. Poiss. xi, p. 301, 1836; Günth. Cat. Fish. iii, p. 239, 1861; Blgr. Freshw. Fish. Afr. iv, p. 110, 1916. *Alticus* (Commers.) Blkr. Versl. Ak. Amsterd. (2) iii, 1869, p. 235.

**Salarias dussumieri**, Cuv. & Val.

*Salarias dussumieri*, Cuv. & Val. xi, p. 310, 1836; Jerdon, Madras Journ. Lit. and Sci. 1851, p. 144; Günth. Cat. Fish. iii, pp. 251 and 562, 1861 (**Cape of Good Hope**; coast of Malabar; Port Essington); Playf. Fish. Zanz. p. 77, pl. ix, figs. 6 and 7, 1866 (Aden; Zanzibar); Day, Fish, India, p. 333, pl. lxx, fig. 7, 1876 (Andamans); Pfeffer, Ost-Afrik. Fische, p. 15, 1893 (Bani Isld.); Gilchr. Cat. Fish. 1902, p. 135 (**S. Africa**); Gilchr. & Thomp. Ann. S. A. M. vi, pt. 2, 1908 (Natal).

? *Salarias striato-maculatus*, Kner. & Steindr. Sitz. Ak. Wies. Wien. 1866, liv, p. 368, fig. 4.

**Aspidontus**, Cuv.

*Aspidontus* (Cuv.) Quoy. & Gaim. Voy. *Astrolabe*, Zool. iii, p. 719, 1834; Jord. & Snyd. Bull. U. S. Nat. Mus. xxv, 1903, p. 453.

*Ornobranchus* (Ehrenberg, pl. xi, fig. 91) Swainson, Class'n. Fishes, ii, p. 274, 1893.

**Aspidontus woodi**. Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 105 (**Nahoon River**).

**Clinus**, Cuv. & Val.

*Clinus* sp., Cuv. Règne Anim. 1817.

*Clinus*, Cuv. & Val. Hist. Nat. Poiss. xi, p. 352, 1836; Günth. Cat. Fish. iii, p. 261, 1861.

*Cirrhibarbis*, Cuv. & Val. t.c.p. 406, 1836.

*Labrosomus*, *Gobioclinus*, *Blennioclinus*, *Ancheniorschus*, *Malacoctenus*, *Callinclinus* et *Ophthalmolophus*, Gill, Proc. Acad. Nat. Sc. Philad. 1860, p. 102.

**Clinus acuminatus**, Cuv. & Val.

Cuv. & Val. xi, p. 370, 1836 (**Cape**; abundant); Blkr. Visch. v. d. Kaap, p. 54, name only, 1860 (**S. Africa**); Cast. Mem. p. 53, 1861 (**Table Bay**, in the rocks towards **Green Point**; June and July); Günth. Cat. Fish. iii, p. 269, 1861 (**Cape of Good Hope**); Kner. *Novara*, Fische, p. 202, 1865 (**Cape Town**); Gilchr. Cat. Fish. 1902, p. 133 (**S. Africa**); Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 124 (abundant on littoral of **Cape Peninsula**).

**Clinus anguillaris**, Cuv. & Val.

(Slangetje).

Cuv. & Val. xi, p. 390, pl. 334, 1836 (**Cape**) ; Blkr. Visch. v. d. Kaap, pp. 54 and 71, 1860 (**S. Africa**) ; Cast. Mem. p. 53, 1861 (**Cape**) ; Günth. Cat. Fish. iii, p. 271, 1861 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. 1902, p. 133 (**S. Africa**) ; Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 133 (**False Bay**).

*Blennophis anguillaris*, Swainson, Fishes, ii, p. 276, 1839.

**Clinus biporusus**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 137 (off **Seal Isld.**, **False Bay**, 14 fms. ; **St. James, Kalk Bay**, amongst rocks).

**Clinus brachycephalus**, Cuv. & Val.

*Clinus brachycephalus*, Cuv. & Val. xi, p. 371, 1861 (**Cape**) ; Cast. Mem. p. 54, name only, 1861 (**Cape Seas**) ; Günth. Cat. Fish. iii, p. 264, 1861 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. 1902, p. 133, (**S. Africa**) ; Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 135 (**False Bay**).

*Blennioclinus brachycephalus*, Gill, Proc. Ac. Nat. Sc. Philad. 1860, p. 103, and Jord. & Everm. Fish. N. and Mid. Amer. p. 2360, 1898—footnote.

**Clinus brevicristatus**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 118 (**Kalk Bay**).

**Clinus capensis**, Cuv. & Val.

*Cirrhibarbis capensis*, Cuv. & Val. xi, p. 406, pl. 337, 1836 (**Cape**) ; Blkr. Visch. v. d. Kaap, p. 55, name only, 1860 (**S. Africa**).

*Clinus capensis*, Günth. Cat. Fish. iii, p. 269, 1861 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. 1902, p. 133 (**S. Africa**) ; Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 131 (**False Bay**).

**Clinus cottoides**, Cuv. & Val.

Cuv. & Val. xi, p. 367, 1836 (**Cape**) ; Blkr. Visch. v. d. Kaap, p. 54, name only, 1860 (**S. Africa**) ; Cast. Mem. p. 52, 1861 (**Cape**) ; Günth. Cat. Fish. iii, p. 269, 1861 (**Cape of Good Hope**) ; Kner, *Novara*, Fische, p. 202, 1865 (**Cape of Good Hope**) ; Gilchr. Cat. Fish. 1902, p. 133 (**S. Africa**) ; Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 125 (**False Bay**).

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**Clinus dorsalis.** Blkr.*(Kapitein-visch).*

*Blennius capite enbacuto, pinna dorsi tota aculeata,* Seba, Thes. iii, tab. 30, fig. 1, p. 90, 1758.

*Clinus dorsalis*, Blkr. Visch. v. d. Kaap, pp. 54 and 74, 1860 (**Cape of Good Hope**); Günth. Cat. Fish. iii, p. 271, 1861 (**Cape of Good Hope**); Cast. Mem. p. 54, 1861 (**Table Bay**, amongst the rocks, taken in June and August); Gilchr. Cat. Fish. 1902, p. 133, (**S. Africa**); Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 132 (**False Bay**).

**Clinus fucorum**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 121 (**St. James** and **Kalk Bay**).

**Clinus graminis**, Gilchr. & Thomp.*(Grass Klipfish).*

Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 137 (**False Bay**).

**Clinus heterodon**, Cuv. & Val.

Cuv. & Val. xi, p. 394, 1836 (**Cape**); Blkr. Visch. v. d. Kaap, p. 54, name only, 1860 (**S. Africa**); Cast. Mem. p. 54, name only, 1861 (**Cape Seas**); Günth. Cat. Fish. iii, p. 270, 1861 (**Cape of Good Hope**); Gilchr. Cat. Fish. 1902, p. 132 (**S. Africa**); Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 138 (quoted).

**Clinus latipinnis**, Cuv. & Val.

*Clinus latipinnis*, Cuv. & Val. xi, p. 394, 1836 (**Cape**); Blkr. Visch. v. d. Kaap, p. 54, name only, 1860 (**S. Africa**); Cast. Mem. p. 53, 1861 (**Table Bay**); Günth. Cat. Fish. iii, p. 267, 1861 (**Cape of Good Hope**); Gilchr. Cat. Fish. 1902, p. 133 (**S. Africa**); Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 127 (**False Bay**).

*Ophthalmolophus latipinnis*, Gill, Proc. Ac. Nat. Sc. Philad. 1860, p. 103.

**Clinus mus**, Gilchr. & Thomp.*(Mouse Klipfish.)*

Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 119 (**False Bay**).

**Clinus ornatus**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S. A. Mus. vi, pt. 2, 1908, p. 116 (**False Bay**; **Roman Rock**, **False Bay**, 13 fms.).

**Clinus pavo**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 123 (**St. James** and **Kalk Bay**).

**Clinus robustus**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 128 (**Seal Isld.**, **False Bay**; **Kalk Bay**).

**Clinus striatus**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 134 (**Simons Bay**).

**Clinus superciliatus**, Linn.

(*Klip-visch.*)

*Blennius varius*, Seba, Thes. iii, p. 90, tab. 30, figs. 3 and 4, and p. 93, tab. 30, fig. 8, 1758.

*Blennius superciliatus*, Linn. Syst. Nat. i, p. 442, 1735; Bl. Ichth. taf. 168, 1797; Bl. Schn. Syst. Ichth. p. 170, 1801; Lacép. Hist. Nat. Poiss. ii, pp. 458 and 470, 1800 (Seas of India).

? *Blennius mustelaris*, Linn. Mus. Ad. Fried. 1754, p. 69, pl. 31, fig. 3, and Syst. Nat. i, p. 443, 1735.

? *Blennius cinereus*, Linn. Mus. Ad. Fried. p. 69.

*Blennius sp.*, Gronov. Mus. Ichth. ii, p. 21, no. 172, tab. 5, fig. 5, 1756, and Zoophyl. no. 258, 1763.

*Blennius punctulatus*, Lacép. Hist. Nat. Poiss. ii, pp. 460, 506, pl. 12, fig. 3, 1800 (no locality stated).

*Blennius mustela*, Lacép. t.c. pp. 459, 484, 486 (India).

*Blennius capensis* (Forster) Bl. Schn. Syst. Ichth. p. 175, 1801; Forst. Descr. Anim. ed. Licht. p. 408, 1844.

*Blennius spadicens*, Bl. Schn. Syst. Ichth. p. 172, 1801.

? *Blennius rubiscens*, Lichtensteins Travels, 1812.

*Clinus superciliatus*, Cuv. & Val. xi, p. 360, pl. 331, 1836 (**Cape of Good Hope**; abundant); Blkr. Visch. v. d. Kaap, pp. 55 and 70, 1860 (**Cape**); Cast. Mem. p. 51, 1861 (**Table Bay**; very common all the year round); Günth. Cat. Fish. iii, p. 268, 1861 (**Cape of Good Hope**); Kner, *Novara*, Fische, p. 200, 1865 (**Cape of Good Hope**); Gilchr. Cat. Fish. 1902, p. 132 (**S. Africa**); Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 113 (**Walvisch Bay**; **Hoetjes Bay**; **Robben Isld.**; **Cape Peninsula**; **L'Agulhas Point**; **East London**).

*Blennius versicolor*, Pappe, Synops. p. 19, no. 36, 1853 (**Robben Isld.**; **Cape Seas**); Blkr. Visch. v. d. Kaap, p. 55, name only, 1860 (**Cape**).

*Blennius mycterizans*, *ignobilis*, *mustellaris*, Gronov. Syst. ed.

Gray, pp. 97, 98 (**Cape of Good Hope**).

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*Clinus dubuis* (Casteln.), Blkr. Visch. v.d. Kaap, pp. 54 and 71, name only, 1860 (**Cape**).

*Clinus dubius*, Cast. Mem. p. 511, 1861 (very common in **Table Bay**).

*Clinus pantherinus, marmoratus*, Cast. Mem. p. 52, 1861 (**Table Bay**).

**Clinus superciliatus**, Linn., var. **arborescens**,  
Gilchr. & Thomp.

*Clinus superciliatus*, var. *arborescens*, Gilchr. & Thomp.  
Ann. S.A. Mus. vi, pt. 2, 1908, p. 115 (**Kommetje, Cape Peninsula** ; **False Bay** ; **Roman Rock**, 13 fms.).

**Clinus taurus**, Gilchr. & Thomp.

(*Bull-klip.*)

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908 p. 126  
(**Kommetje, Cape Peninsula**, and **False Bay**).

**Clinus venustris**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 130  
(**Fishhoek, Kalk Bay**).

**Cristiceps**, Cuv. & Val.

*Clinus sp.* Cuv. & Val. xi, p. 352, 1836.

*Cristiceps*, Cuv. & Val. xi, p. 402, 1836 ; Günth. Cat. Fish. iii, p. 372, 1861.

**Cristiceps argentatus**, Risso.

*Blennius argentatus*, Risso, Ichth. Nice, p. 140, 1810.

*Blennius audifredi*, Risso, Ichth. Nice, p. 139, 1810.

*Clinus argentatus testudinarius virescens, audifredi*, Risso, Eur. Mérid. iii, pp. 238, 239 and 240, 1827 ; Cuv. & Val. xi, p. 354, 1836 ; Guichen. Explor. Algér. Poiss. p. 74, 1850.

*Clinus mutabilis*, Cocco, Giorn. Sc. Lett. e. Arti, Sicil. April, 1833, xlvi, p. 9, tab. 42, fig. 2.

*Cristiceps argentatus*, Günth. Cat. Fish. iii, p. 272, 1861 (Mediterranean ; **Cape of Good Hope** ; Coast of Australia) ; Gilchr. Cat. Fish. 1902, p. 134 (**S. Africa**) ; Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 138 (quoted).

**Cristiceps mentalis**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 139 (**East London**).

**Tripterygium**, Risso.

*Tripterygium*, Risso, Enr. Mérid. iii, p. 241, 1827; Jord. & Snyd. Proc. U.S. Nat. Mus. xxv, 1903, p. 444.

*Euneapterygius*, Russell, Neue Wirbelthiere, p. 2, 1837.

*Tripterygium*, Günth. Cat. Fish. iii, p. 276, 1861 (corrected spelling).

*Euneanectes*, Jord. & Everm. Proc. Calif. Ac. Sci. 1895, p. 5101.

*Gillias*, Everm. & Marsh, Rept. U.S. Fish. Comm. 1899, p. 357.

**Tripterygium capense**, Gilchr. & Thomp.

Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 2, 1908, p. 140  
(**False Bay**, off, **Seal Isld.** 14 fms., in **Fishhoek Bay** 5 fms.)

FAMILY **BATRACHIDAE**.**Opsanus**, Rafinesque.

*Opsanus*, Rafinesque, Amer. Monthly Mag. 1817, p. 203; Jord. & Everm. Fish N. and Mid. Amer. p. 2315, 1898.

*Batrachus* (part.), Günther, Cat. Fish. iii, p. 166, 1861; Jord. & Gilbert, Synops. p. 751, 1883 (not of Bloch & Schneider).

**Opsanus apiatus**, Cuv. & Val.

*Batrachus apiatus*, Cuv. & Val. xii, p. 477, 1837; Cuv. Règne Anim. Ill. Poiss. pl. 85, fig. 3, 1850; Blkr. Visch. v. d. Kaap, p. 55, name only, 1860 (**Cape**); Günth. Cat. Fish. iii, p. 559, 1861 (**Cape Seas**); Gilchr. Cat. Fish. 1902, p. 130 (**S. Africa**); Gilchr. & Thomp. Ann. S.A. Mus. xiii, pt. 3, 1914, p. 71 (off Natal coast, 54 fms.).

FAMILY **OPHIDIIDAE**.**Cataetyx**, Günth.

Günth. *Challenger*, Deep Sea Fishes, xxii, p. 104, 1887; Goode & Bean, Ocean Ichth. p. 317, 1896; Jord. & Everm. Fish. N. and Mid. Amer. p. 2504, 1898.

**Cataetyx messieri**, Günth.

*Sirembo messieri*, Günth. Ann. & Mag. Nat. Hist. ii, 1878, p. 19.

*Cataetyx messieri*, Günth. *Challenger*, Deep Sea Fish. xxii, p. 104, pl. xxiii, fig. B, 1887 (off Middle Isld., Messier Strait, 345 fms.); Goode & Bean, Ocean Ichth. p. 318, name only and fig. in text, 1896 (Messier Strait, quoted); Gilchr. Mar. Inv. S. Afr. iii, 1905, p. 141 (**Cape Point**, 80° E. 32 miles, 460 fms.; N.E. 40 miles, 560-700 fms.).

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**Selachophidium.** Gilchr.Gilchr. Mar. Inv. S. Afr. ii, 1904, p. 209 (**S. Africa**).**Selachophidium guentheri**, Gilchr.Gilchr. Mar. Inv. S. Afr. ii, 1904, p. 209, pl. xvii (off **Cape****Peninsula, Table Mountain**, N.  $79^{\circ}$  E., 40 miles, 250 fms.);Gilchr. & Thomp. Ann. S.A. Mus. xiii, pt. 3, 1914, p. 88  
(Natal coast, 440 fms.).**Genypterus**, Philippi.*Xiphiurus*, Smith. Ill. Zool. S. Afr. Pisces, pl. 31, 1849 (name pre-occupied).*Genypterus*, Philippi, in Wieg. Archiv. 1857, p. 268; Günth. Cat. Fish. iv, p. 379, 1862.*Holophycis*, Kaup, in Wieg. Archiv. 1858, p. 93.**Genypterus capensis**, Smith.

(King Klip-fish.)

*Muraenoides*, Barrow, Travels, p. 30, 1797 (King rock-fish sometimes caught in **Table Bay**).*Ophidium blacodes*, (part.), Forst. Descr. Anim. p. 115, 1844 (Bl. Schn. Syst. Ichth. p. 485, 1801) *De Konig van Klip-vissen* (**Cape of Good Hope**).*Xiphiurus capensis*, Smith, Ill. Zool. S. Afr. Pisces, pl. 31, 1849 (*Konig Klip Visch*). During one of the several earthquakes which occurred several years ago at the **Cape of Good Hope** one or more sandbanks were found near the entrance to **Table Bay**, and not long after the first specimens of the fish were obtained. Since then it has always been on the market, but on no occasion in great abundance; Pappe, Synops. ed. 1, 1815 or 2nd ed. p. 21, 1866 (Rather scarce. Pappe contradicts Smith and states that his remarks should be applied to the Stok-visch, *Merluccius capensis*, Cast.); Blkr. Visch. v. d. Kaap, p. 54, name only, 1860 (**Cape**); Cast. Mem. p. 70, 1861 (**Cape markets**; very rare).*Hoplophycis lalandii*, Kaup in Wieg. Archiv. 1858, p. 93.*Genypterus capensis*, Günth. Cat. Fish. iv, p. 379, 1862 (**Cape**); Gilchr. Cat. Fish. 1902, p. 143 (**S. Africa**); Regan, Ann. Natal Mus. i, pt. 1, 1906, p. 6 (Coast of Natal), and Col. Fish. 1908, p. 247 (**Bird Isld.**).DIVISION **TAENIOSOMI.**FAMILY **TRACHYPTERIDAE.****Regalecus**, Brünnich.*Regalecus*, Brünn. Nya Saml. Vid. Selsk. Skriot. iii, 1788, p. 414; Günth. Cat. Fish. iii, p. 307, 1862.*Gymnetrus*, Bl. Schn. Syst. Ichth. p. 481, 1801; Cuv. & Val. x, p. 352, 1835.

**Regalecus gladius**, Walb.

*Cepola gladius*, Walb. Artidi Pisc. iii, p. 617, 1792.

*Gymnetrus longeradiatus*, Risso, Eur. Mérid. iii, p. 296, 1827.

*Gymnetrus gladius*, Cuv. & Val. x, p. 352, pl. 298, 1835.

*Gymnetrus capensis*, Cuv. & Val. x, p. 376, 1835 (**Cape**) ; Blkr. Visch. v. d. Kaap, p. 54, name only, 1860 (**Cape**) ; Cast. Mem. p. 45, 1861 (**Cape** ; one imperfect specimen found) ; Günth. Cat. Fish. iii, p. 308, 1861 (**Cape of Good Hope**) and Günth. *Challenger*, Deep Sea Fish. xxii, p. 75, 1887 (**Simons Bay**) ; Layard, Proc. Zool. Soc. 1868, p. 319 (**Table Bay**).

*Regalecus gladius*, Günth. Cat. Fish. iii, p. 308, 1861 (Nice ; Bermudas ; **Cape of Good Hope**) ; Canestrini, Faun. Ital. Pisci, p. 195, 1874 ; Giglioli, Elenco, p. 32, 1880 ; Moreau, Hist. Nat. Poiss. France, p. 555, 1881 ; Gilchr. Cat. Fish. 1902, p. 138 (**S. Africa**).

FAMILY **LOPHOTIDAE.****Lophotes**, Giorna.

Giorna, Mem. Accad. Torino, ix, 1803, p. 19 ; Cuv. Règne Anim. 1817 ; Cuv. & Val. Hist. Nat. Poiss. x, p. 405, 1835 ; Günth. Cat. Fish. iii, p. 312, 1861.

**Lophotes cepedianus**, Giorna.

*Lophotes cepedianus*, Giorna, Mem. Ac. Torino, ix, 1803, p. 19, pl. 11, fig. 1 ; Cuv. Ann. Mus. d'Hist. Nat. xx, p. 393, pl. 17 ; Cuv. & Val. x, p. 405, pl. 301, 1835 ; Günth. Cat. Fish. iii, p. 312, 1861 (Mediterranean ; **Cape** ? ; Sea of Japan), and *Challenger* Deep Sea Fish., xxii, 1887, p. 76 (Mediterranean ; off Madeira ; Sea of Japan) ; Trimen, Proc. Zool. Soc. (**False Bay**) ; Bouleng. Mar. Inv. S. Afr. i, 1902, p. 13, pl. iv (**Mossel Bay**) ; Gilchr. Cat. Fish. 1902, p. 139 (**S. Africa**) ; Canestrini Faun. Italica Pisci, p. 195, 1874 ; Giglioli, Elenco, p. 32, 1880 ; Moreau, Hist. Nat. Poiss. France, ii, p. 250, 1881 ; Goode & Bean Ocean Ichth. p. 349, 1896 (Mediterranean).

**Lophotes fiski**, Günth.

*Lophotes fiskii*, Günth. Proc. Zool. Soc. 1890, pp. 244-247, pl. xix (**Kalk Bay**) ; Gilchr. Cat. Fish. 1902, p. 139 (quoted).

*Lophotes fiski*, Waite, Rec. Canterbury Mus. i, no. 1, 1907 (New Zealand).

SUB-ORDER **Pediculati.**FAMILY **LOPHIIDAE.****Lophius piscatorius**, Linn.

(Angler ; Fishing-Frog ; Padda.)

Αλιάς Βατον, Aristotle, Hist. Anim. ix, cap. 37, ii, cap. 13, v, cap. 5 and 14.  
 Βατραλος, Αλιάς, Arist. ix, cap. 37; Äelian, vii, p. 286, A.D. 120; Oppian, ii, p. 33, A.D. 200.  
*Rana*, Ovid, v. p. 126; Pliny, ix, cap. 24; xxv, cap. 10.  
*Rana marina*, Bellon. p. 85, 1553; Jonston, Pisc. i, lib. 1, tit. 1, cap. 3, art. 3, punct. 9, p. 36, tab. 2, fig. 8, 1649.  
*Rana piscatrix*, Rondel. i, lib. 12, cap. 20, p. 363, 1554; Salvian. Hist. Aquat., p. 129, fig. 47, 1554; Gesner, Aquat. iv, p. 813, 1558; Schonev. p. 59, 1624; Aldrov. iii, cap. 64, p. 466, 1638; Willughby, p. 85, tab. E1, 1686; Ray, Synops. p. 29, 1713.  
*Lophius*, Artedi, Gen. p. 63, sp. 1, Synon. p. 87, 1738; Gronov. Mus. i, p. 57, 1756 and Zoophyl. p. 58, 1763.  
*Batrachus*, Klein, Pisc. Miss. iii, p. 15, sp. 1 and 2, 1749.  
*Lophius piscatorius*, Linn. Syst. Nat. ed. x, i, p. 236, 1758 (Seas of Europe), and Faun. Svec. p. 108; Mull. Prodr. Zool. Dan. p. 38, 1777, Retz. Faun. p. 308; Brünn Pisc. Muss. p. 7, 1768; Lacép. Hist. Nat. Poiss. i, pp. 304-317, pl. 13, fig. 1, 1798 (Seas of South America); Bl. Ichth. iii, p. 82, tab. 87, 1797, Bl. Schn. Syst. Ichth. p. 139, 1801; Donovan, Brit. Fish. v, pl. 101, 1808; Turton, Brit. Faun. p. 115, 1807; Cuv. Règne Anim. 1817; Fleming, British An. p. 214, 1828; Low, Faun. Orcad. p. 183, 1813; Mohr. Isl. Naturh. p. 61, ; Faber, Fische Isl. p. 55, 1829; Shaw, Nat. Misc. xi, pl. 422; Jenyns, British Vert. p. 389, 1835; Parn. Werner Mem. vii, p. 253; Yarrell, British Fish. i, p. 269, 1836, 2nd ed. i, p. 305, 1841, 3rd ed. ii, p. 388, 1859; Nils. Skand. Faun. Fisk. p. 245, 1836; Cuv. Règne Anim. Ill. Poiss. pl. 84, 1850; Gronov. Syst. ed. Gray, p. 47, 1854 (Atlantic and Pacific Oceans); Nordin. in Demid. Voy. Russ. Mérid. iii, p. 444, 1840; Gaimard, Voy. Isl. et Grönland, Zool. Poiss. pl. 19, 1851; Guichen. Explor. Algér. Poiss. p. 80, 1850; Günth. Cat. Fish. iii, p. 179, 1861 (British coast, scarce beyond 60° N. Lat.); **Cape Seas**, and Challenger, Deep Sea. Fish. xxii, p. 49, 1887 (New England and coast, 120-365 fms.); Gill, Proc. U.S. Nat. Mus. 1878, p. 219; Jord. & Gilbert, Synops. p. 884, 1883; Day, Fish. Gt. Britain and Irel. i, p. 73, pl. xxix, 1884; Vaillant, Exp. Sci. *Travailleur et Talisman*, p. 345, 1888; Goode & Bean, Ocean Ichth. p. 485, 1896 (North Atlantic Ocean, ranges South to

**Cape of Good Hope**; Jord. & Everm. Fish. N. and Mid. Amer. p. 2713, 1898 (N. Atlantic, on both coasts; generally common, ranging southward along the shore to Cape Hatteras; found in deep water as far South as Barbadoes, in 209 fms., and to the **Cape of Good Hope**; northward to Norway and Nova Scotia); Herdm. & Daw. Fish. Irish Sea, p. 36, 1902 (Fairly common all round the British coast); Gilchr. Cat. Fish. 1902, p. 130 (**S. Africa**); Regan, Col. Fish. Rio Janeiro, in Proc. Zool. Soc. 1903, ii, p. 68 (Rio Janeiro), and *Terra Nova*. Exped. Zool. Fishes, p. 23, name only, 1914 (off Cape Frio, Brazil, 40 fms.).

*Fishing Frog*, Borlase, Cornwall, p. 266, pl. 27, fig. 5, 1758; Pennant, British Zool. iii, p. 105, pl. 18, 1769 and ed. 1812, iii, p. 159, pl. 21.

*Batrachus piscatorius*, Risso, Ichth. Nice, p. 47, 1810, and Eur. Méréd. iii, p. 170, 1827.

*Lophius americanus*, Cuv. & Val. xii, p. 380, 1837 (Philadelphia); Store. Hist. Fish. Massachusetts, pl. 18, fig. 2, p. 101, 1867.

### **Lophius upsicephalus**, Smith.

*Lophius upsicephalus*, Smith, Ill. Zool. S. Afr. Pisces, pl. 9 (bad), 1849 (Seas of **Cape of Good Hope**); Günth. Cat. Fish. iii, p. 181, 1861 (quoted); Gilchr. Cat. Fish. 1902, p. 130 (**S. Africa**); Gilchr. & Thomp. Ann. S. A. Mus. xiii, pt. 3, 1914, p. 73 (off Natal coast, 54 fms.)

? *Lophius cynocephalus*, Blkr. Visch. v. d. Kaap, p. 55, name only, 1860 (**Cape Seas**), wrongly quoted as Smith's.

### **Lophius vomerinus**, Cuv. & Val.

Cuv. & Val. xii, p. 381, 1837 (**Cape of Good Hope**); Blkr. Visch. v. d. Kaap, p. 55, name only, 1860 (**Cape Seas**); Günth. Cat. Fish. iii, p. 181, 1861 (quoted); Gilchr. Cat. Fish. 1902, p. 130 (**S. Africa**).

## FAMILY CERATIIDAE.

### **Melanocetus**, Günth.

Günth. Proc. Zool. Soc. 1864, p. 301, and *Challenger* Deep Sea Fishes, xxii, p. 56, 1887; Gill, Proc. U. S. Nat. Mus. i, 1878, p. 227; Goode & Bean, Ocean. Ichth. p. 494, 1896.

### **Melanocetus rotundatus**, Gilchr.

Gilchr. Mar. Inv. S. Afr. ii, 1904, p. 206, pl. xv (off **Cape Point**, 600 fms.; off Cape Natal, immature).

## FAMILY ANTENNARIIDAE.

**Pterophryne**, Gill.

*Chironectes*, Cuv. Règne Anim. 2nd ed. ii, p. 252, 1829 (name preoccupied in Mammals).

*Antennarius* (part.), Günth. Cat. Fish. iii, p. 183, 1861.

*Pterophryne*, Gill, Proc. Ac. Nat. Sc. Philad. 1863, p. 90; Goode & Bean, Ocean. Ichth. p. 486, 1896; Jord. & Everm. Fish. N. and Mid. Amer. p. 2715, 1898.

*Pterophrynoïdes*, Gill, Proc. U. S. Nat. Mus. i, 1878, p. 216 (substitute for *Pterophryne*, if the latter be regarded as preoccupied by the earlier name *Pterophrynus*).

**Pterophryne histrio**, Linn.

*Lophius tumidus*, Osbeck, Iter. Chin. p. 400, 1757 (open sea).

*Lophius histrio*, Linn. Syst. Nat. ed. x, p. 237, 1758 (after various authors, especially *Balistes guaperva* sen *chinensis*, Linn. Mus. Ad. Fr. p. 56, 1754); Gronov. Syst. ed. Gray, p. 48, not synon., 1854 (in the Ocean among floating weed).

*Lophius histrio* var. *marmoratus*, Bl. Schn. Syst. Ichth. p. 142, 1801.

*Lophius geographicus*, Quoy & Gaim. Voy. *Uranie*, i, p. 355, pl. 65, fig. 3, 1824.

*Chironectes marmoratus*, Lesson, Voy. *Coquille*, Zool. ii, p. 145, Poiss. pl. xvi, fig. 2, 1838; Temm. & Schleg. Faun. Japon. Poiss. p. 159, pl. lxxxii, fig. 1, 1845.

*Chironectes pictus*, Cuv. & Val. xii, p. 393, 1837 (Surinam).

*Chironectes tumidus*, Cuv. & Val. xii, p. 397, 1837 (Sargasso Sea).

*Chironectes arcticus*, Düben & Koren, Kong. Vet. Akad. Abh. Stockholm, 1844, p. 72 (Vadsö, Norway; from a specimen carried northward in *Sargassum*, the only European record,—*vde* Collett.)

*Chironectes pictus* var. *vittatus*, Richards. Voy. *Erebus* & *Terror*, Fish. p. 15, pl. ix, figs. 3 and 4, 1846.

*Antennarius marmoratus*, Günth. Cat. Fish. iii, pp. 185 and 187, 1861 (Atlantic; China; Madagascar) and *Challenger*, Shore Fishes, p. 44, 1880 (Ki Doulan Little Ki Isld). Day, Fish. Malabar, p. 121, 1865, and Fish. Ind. p. 272, 1876 (Red Sea; East coast Africa; Seas of India to Malay Archipelago and beyond); Kner, *Novara*, Fische, p. 192, 1865; Blkr. Atlas. Ichth. v, p. 23, pl. 198, fig. 4 and pl. 199, fig. 1, 1865; Playf. Fish. Zanz. p. 70, 1866 (Zanzibar); Gilchr. Cat. Fish. 1902, p. 130 (**S. Africa**).

*Chironectes laevigatus*, Dekay, New York Fauna Fish. p. 165, pl. 27, fig. 83, 1842, not of Cuvier.

*Antennarius laevigatus*, Blkr. Visch. v. d. Kaap, pp. 55 and 76, 1860 (Atlantic; Carolina; New York; Massachusetts; Surinam; **Cape of Good Hope**; Mauritius).

*Pterophryne histrio*, Gill, Proc. U. S. Nat. Mus. 1878, p. 216; Goode & Bean, Ocean. Ichth. p. 486, 1896 (St. Vincent; Atlantic Basin); Jord. & Sindo, Proc. U. S. Nat. Mus. xxiv, 1902, p. 368 (coasts of Japan, in the open sea or current of the Kuro Shiwo, not rare; Kisaki; Enoshima); Jord. & Seale, Fish. Samoa, p. 438, 1906 (New Guinea; East Indies) and Fish. Luzon and Panay, p. 48, 1907 (Manila); Jord. Tan. & Snyd. Cat. Fish. Japan, p. 425. 1913 (Misaki; Sagami; Enoshima).

## SUB-ORDER **Plectognathi**.

### DIVISION **SCLERODERMI**.

#### FAMILY **BALISTIDAE**.

##### **Balistes (Artedi)**, Linnaeus.

*Balistes*, Artedi, Genera Pisc. p. 53, 1738; Linn. Syst. Nat. ed. x, p. 327, 1758; Cuv. Règne Anim. 1817; Günth. Cat. Fish. viii, p. 211, 1870; Jord. & Everm. Fish. N. and Mid. Amer. p. 1699, 1898.

*Capriscus* Rafinesque, Indice d' Ittiol Siciliana, p. 41, 1810; Swainson, Nat. Hist. Class'n. Fishes, ii, p. 326, 1839.

*Chaliosoma*, Swainson, t.c.p. 325, 1839.

##### **Balistes vetula**, Linn.

*Guaperoa*, Marcgrave, Hist. Braz. p. 163, 1648 (Brazil); Willughby, App. p. 21, tab. J. 23, 1686.

*Turdus oculo radiato* (the Old Wife) Catesby, Hist. Carol. pl. 22, 1725 (Bahamas).

*Balistes* sp. no. 1, Artedi, Gen. p. 53, and Synon. p. 82, 1738; Gronov. Zoolphyl. no. 195, 1763.

*Balistes vetula*, Linn. Syst. Nat. Ed. x, p. 329, 1758 (Ascension Isld.), after Osbeck, Iter. Chin. p. 294, 1757; Bl. Ichth. tab. 150, 1797; Lacép. Hist. Nat. Poiss. i, pp. 337 and 349, 1798 (Seas of India and America); Bl. Schn. Syst. Ichth. p. 470, 1801; Lesson, Voy. *Coquille*, Zool. ii, p. 113, pl. 9, fig. 2, 1838; Jenyns, Voy. *Beagle*, Fish. p. 155, 1842; Hollard, Ann. Sc. Nat. 1854, i, p. 305; Günth. Cat. Fish. viii, p. 215, 1870 (Bahia; St. Croix; Jamaica; West Indies; **Cape of Good Hope**; India; Amboyna), and *Challenger*, Shore Fishes, p. 5, name only, 1880 (Ascension Isld.); Day, Fish. Ind. p. 688, 1878 (Coromandel coast of India and tropical parts of Atlantic); Jord. & Gilbert, Synops. p. 855, 1883; Jord. & Everm. Fish. N. and Mid. Amer. p. 1703, 1898 (Tropical parts of Atlantic; common in the West Indies; occasionally northward in the Gulf Stream as far as Woods Hole, Mass.); Everm. Fish. Porto Rico, in Bull. U.S. Fish. Comm. xx, 1900, p. 256

(West Indies and occasionally northwardly Gulf Stream to Woods Hole, Mass. ; not uncommon at Key West ; Jamaica ; Bahamas ; Ascension Isld. ; Arroyo, Porto Rico) ; Gilchr. Cat. Fish. 1902, p. 157 (**S. Africa**).

*Balistes bellus*, Walbaum, Artedi. Pisc. iii, p. 467, 1792 (West Indies) after Froyer.

*Chaliasoma Velata*, Swainson, Class'n Fishes ii, p. 325, 1839, after Vetus ; probably misprint.

*Balistes equestris*, Gronov. Syst. ed. Gray, p. 31, 1854 (American Seas).

Skull and dentition, Owen, Osteol. Cat. i, p. 76, 1853 (*B. forcipatus*).

### **Pachynathus**, Swainson.

*Pachynathus*, Swainson, Class'n Fishes ii, p. 326, 1839 (not *Pachygnathus* or *Pachygnatha*, both these names used at an earlier date for genera of spiders) ; Jord. & Everm. Fish. N. and Mid. Amer. p. 1703, 1898 ; Jord. & Fowler, Japanese Trigger-fishes, in Proc. U.S. Nat. Mus. xxv, 1903, p. 254.

*Balistes* (part), Günth. Cat. Fish. viii, p. 211, 1870.

### **Pachynathus capistratum**, Shaw.

*Le Baliste bride*, Lacép. Hist. Nat. Poiss. i, pp. 335, 381, pl. 15, fig. 3, 1798, on a drawing by Commerson, no locality given ; Cuv. Règne Anim. 1817.

*Balistes*, Russell, Fish. Vizagapatam, i, p. 13 and *Rahte yellakah*, fig. xx, 1803.

*Balistes capistratus*, Shaw, Grn. Zool. v. p. 417, 1804 (after Lacépède ; not *Pachynathus capistratus* of Jordan & Everman, which, according to Jordan & Fowler (Jap. Trigger Fishes, p. 255, 1903) is *P. verres*, Gilbert and Starks ; Lacép. ed. Pillot vi, p. 126, 1831 (not of Tilesius) ; Jord. & Everman. Fish. Hawaian Islds. in Bull. U.S. Fish. Comm. xxiii, pt. 1, 1903 (1905), p. 411, and fig. (common about Honolulu) ; Jord. Tan. & Snyd. Cat. Fish. Japan, p. 216, 1913 (Hawaii, Nukahiva ; East Indies ; Riukiu Isld. ; Wakanoura).

*Balistes mitis*, Bennett, Proc. Comm. Zool. Soc. i, 1831, p. 169 (Mauritius) ; Günth. Cat. Fish. viii, p. 218, 1870 (Port Natal ; Zanzibar ; Mauritius ; India ; China ; Observatory Isld. ; Gonzalez Isld.) ; Day, Fish. Ind. p. 689, pl. clxxvii, fig. 3, 1878 (East Coast Africa ; Seas of India to Malay Archipelago and beyond) ; Steindr. Fische Süd-arab. und Sokotra, p. 37, 1902 (Makalla ; Gischin, etc.) ; Gilchr. Cat. Fish. 1902, p. 157 (**S. Africa**) ; Gilchr. & Thomp. Ann. S.A. Mus. vi, pt. 3, 1909, p. 271 (Durban, Natal).

*Balistes ambionensis*, Gray & Hardw. Ill. Indian Zool. i, 1832, Pisces, tab. viii, fig. 2 (Amboyna).

*Rhinecanthus amboinensis*, Swainson, Fishes ii, p. 325, 1839.  
*Pachynathus triangularis*, Swainson, t.c.p. 326, 1839 (Vizagapatam), after Russell, fig. xx.  
*Balistes hihpe*, Richards Voy. *Sulphur*, Fish. p. 127, pl. 60, fig. 2, 1845 (East Indies) and Ichth. China p. 200, 1846.  
*Balistes frenatus*, Richards, t.c.p. 129, pl. 60, fig. 1, 1845 (East Indies) and Ichth. China, p. 201, 1846; Kaup, Sclerod. p. 224; Hollard, Ann. Sc. Nat. 4th series, i, 1854, p. 322, t.v. fig. 3; Blkr. Act. Soc. Sc. Indi. Nurb. i. 1856, p. 74 (Menado), and Atlas Ichth. v, p. 114, pl. ccxxiii, 1865 (Java; Sumatra; Celebes; Amboyna; Obi); Kner, *Novara*, Fische, p. 400, 1865.

*Balistes schmittii*, Blkr. Verh. Bat. Gen. xxiv, 1852, Balist. p. 37 (Sumatra).

*Balistes (Balistapus) frenatus*, Blkr. Atl. Ichth. Balist. p. 114, pl. 223, fig. 2, 1865.

*Pachynathus capistratum*, Jord. & Fowler, Jap. Trigger-fishes, in Proc. U.S. Nat. Mus. xxv, 1903, p. 255 (Pacific Ocean; widely distributed through East Indies and on the coast of China; Wakanoura and Okinawa, Japan; Hawaii; Honolulu).

### **Canthidermis**, Swainson.

*Canthidermis*, Swainson, Nat. Hist. Class'n. An. 11, p. 325, 1839; Jord. & Everm. Fish. N. and Mid. Amer. p. 1705, 1878; Jord. & Fowler, Jap. Trigger-fishes, in Proc. U.S. Nat. Mus. xxv, 1903, p. 260.

*Balistes*, (part), Günth. Cat. Fish. viii, p. 211, 1870.

### **Canthidermis maculatus**, Gmel.

*Balistes maculatus*, Gmel. Linn. Syst. Nat. i, p. 1468, 1788; Bonnet. Encyl. Ichth. p. 18, t. xi, fig. 37, 1788; Lacép. Hist. Poiss. 1, pp. 334 and 361, 1798 (Warm seas of the New and Old Continents); Kaup, Sclerod. p. 223; Hollard, Ann. Sc. Nat. 1, 1854, p. 58; Blkr. Atlas Ichth. v, p. 122, t. ccxviii, fig. 4, 1865 (not of Bloch); Kner. *Novara*, Fische, p. 401, 1865; Günth. Cat. Fish. viii, p. 213, 1870 (West Indies; **Cape of Good Hope**; Zanzibar; India; Siam; Malay Peninsular; Formosa; China; Japan; Penang; Sandelwood Isld.; Borneo) and *Challenger*, Shore Fishes, p. 57, 1880 (Admiralty Islds.), name only; Day, Fish. Ind. p. 687, pl. clxxvi, fig. 3 (Indian and Atlantic Oceans, more especially in their tropical and sub-tropical portions; also the Pacific, and occasionally on the British coasts. Very common at Madras); Gilchr. Cat. Fish. 1902, p. 157 (**S. Africa**).

*Balistes rotundatus*, Procé, Bull. Soc. Philom. p. 130, 1822 (Manila).

? *Balistes angulosus*, Quoy & Gaim. Voy. *Uranie*, Zool. p. 210, 1824; Hollard, t.c.p. 57.

*Balistes azureus*, Lesson, Voy. *Coquille*, Zool. II, p. 121, pl. x, fig. 2, 1824.

*Balistes oculatus*, Gray & Hardw. Ill. Ind. Zool. Fish. pl. viii, fig. 1, 1832 (India); Blkr. Atlas Ichth. Balist. p. 121, pl. iv, fig. 2, 1865.

*Balistes willughbeii*, Benn. Proc. Comm. Zool. Soc. i, p. 168, and in Beechey's Voy. *Blossom*, Zool. p. 68, pl. 21, fig. 2, 1839 (Acapulco).

*Canthidermis oculatus*, Swainson, Fishes, ii, p. 325 (1839).

?? *Balistes adspersus*, Tschudi. Faun. Peruana, p. 31, 1846 (Peru).

*Balistes conspicillum*, Cantor, Cat. Malay. Fish. p. 344, 1849 (not synon.).

*Balistes senticosus*, Richards. Voy. *Samarang*, Fish. p. 23, pl. ix, figs. 5-8, 1850 (China Sea); Blkr. Nat. Tijds, Ned. Ind. v, 1853, p. 93 (Solor).

*Balistes brevissimus*, Hollard, t.c.p. 56, pl. 3, fig. 1, 1854.

*Balistes longissimus*, Hollard, t.c.p. 60, pl. 3, fig. 3, 1854.

*Balistes longus*, Gronov. ed Gray, p. 37, 1854 (American Ocean).

*Canthidermis willughbeii*, Jord. & Everm. Fish. N. and Mid. Amer. p. 1707, 1898 (East Indies, once doubtfully recorded from Acapulco).

*Canthidermis rotundatus*, Jord. & Fowler, Jap. Trigger-fishes, in Proc. U.S. Nat. Mus. xxv, 1903, p. 260 (common in East Indies; rare or casual in Japan); Jord. Tan. and Snyd. Cat. Fish. Japan, p. 216, 1913 (East Indies; Riukiu Isld.; Misaki; Sagami-Snyder M.S.).

### Monacanthus.

*Monacanthus*, Cuv. Règne. Anim. Ed. i, p. 152, 1817; Günth. Cat. Fish. viii, p. 229, 1870; Jord. & Everm. Fish. N. and Mid. Amer. p. 1714, 1898.

*Trichoderma*, Swainson, Nat. Hist. Class'n. Fishes, ii, p. 137, 1839.

*Stephanolepis*, Gill. Proc. Ac. Nat. Sc. Philad. 1861, p. 78.

### Monacanthus pardalis, Rüpp.

*Grynzert*, Houttuyn, i, p. 462, tab. 69, fig. 1, 1782 (Nagasaki).

? *Balistes sandwichensis*, Quoy & Gaim. Voy. *Uranie*, Zool. p. 214, 1824.

*Monacanthus pardalis*, Rüpp. N. W. Fische (1855), p. 57, taf. 15, fig. 3, 1838; Hollard, Ann. Sc. Nat. 1854, ii, p. 328; Günth. Cat. Fish. viii, p. 230, 1870 (**Cape of Good Hope**; Zanzibar; East Indian Archipelago; Amboyna; Moluccas; Atlantic Ocean); Gilchr. Cat. Fish. 1902, p. 157 (**S. Africa**) and *Challenger*, Shore Fishes,

p. 54, name only, 1880 (Reefs of Zebu); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 273 (Natal), Regan, Ann. Durban Mus. i, pt. 3, 1916, p. 170 (Durban).

*Monacanthus melanuropterus*, Blkr. Nat. Tijds. Ned. Ind. iii, 1852, p. 781 (Celebes).

*Monacanthus houttyni*, Blkr. t.c.v., 1853, p. 351 (Sumatra).

*Monacanthus aspersus*, Hollard, t.c.p. 362, 1854.

*Liomonacanthus pardalis*, Blkr. Ned. Tijds. Dierk. iii, 1866, p. 27 (Indian Archipelago), and Atlas Ichth. Balist. p. 136, tab. 230, fig. 2, 1865.

*Monacanthus fronticinctus*, Günth. Fish. Zanz. p. 136, pl. 19, fig. 2, 1866, typ. specimen, not no. 521 (Zanzibar).

? *Cantherines pullus*, Jord. & Everm. Fish. N. and Mid. Amer. p. 1713, 1898 (West Indies and coast of Brazil, occasionally North to Florida); Everm. & Marsh, Fish. Porto Rico, in Bull. U.S. Fish. Comm. xx, pt. 1, 1900, p. 258 (Arroyo, probably not abundant in Porto Rico).

*Monacanthus (Cantherines) pardalis*, Steindr. Fische Sud-arab und Sokotra, p. 37, 1902 (Makalla).

### **Monacanthus setifer**, Benn.

(File-fish.)

*Monacanthus setifer*, Bennett, Proc. Comm. Zool. Soc. 1830, p. 112; Hollard. Ann. Sc. Nat. 1854, ii, p. 342, pl. 12, fig. 4; Günth. (part.) Cat. Fish. viii, p. 239, 1870 (Zanzibar; China; Japan), and Challenger Shore Fishes, pp. 3 and 74, name only, 1880 (St. Vincent; market at Yokohama), Day, Fish. Ind. p. 692, 1878 (East coast Africa; Sea of India to China and Japan; tropical and sub-tropical Atlantic); Nystrom, Sven. Vet. Handl. 1887, p. 47 (Nagasaki); Gilchr. Cat. Fish. 1902, p. 157 (**S. Africa**); Regan. Trans. Linn. Soc. Zool. xii, pt. 3, 1908, p. 252 (Seychelles, 37 fms.); Gilchr. & Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909 (Natal); Seale, Fish. Hongkong, p. 73, 1914 (Hongkong); Pellegrin, Ann. Inst. Ocean. Monaco, tome vi, fasc. iv, 1914, Poiss. p. 86 (M'bao, near Dakar); Bamber, Journ. Linn. Soc. xxxi, Zool. no. 210, 1915, p. 485 (Sudanese Red Sea).

*Monacanthus cirrhifer*, Schlegel. Faun. Japon. Poiss. p. 290, pl. cxxx, fig. 1, 1850 (Nagasaki); Blkr. Act. Soc. Indo-Nederl. iii, 1858, Japan iv, p. 31; Steindr. Reise Aurora, p. 223, 1898 (Kobe), and Fische Süd-arab. und Sokotra, p. 37, 1902 (Makalla; Gischin); Jord. & Snyd. Check List, p. 93, 1901 (Yokohama); Jord. Tan. & Snyd. Cat. Fish. Japan, p. 217, 1913 (Tokyo to Nagasaki).

*Monacanthus komuki*, Blkr. Verh. Ak. Vet. i, 1853, p. 13, fig. 1 (Kaminoseki), and Act. Soc. Sc. Indo-Nederl. iii, 1858, Japan, iv, p. 31 (Kaminoseki).

*Monacanthus auratus*, Cast. Mem. p. 77, 1861 (**Algoa Bay**).  
[C.P. 3—1918]

*Stephanolepis cirrifer*, Jord. & Fowler, Jap. Trigger-fishes, Proc. U.S. Nat. Mus. xxv, 1903, p. 264 (very common in shallow, sandy bays in Southern Japan).

## SUB-ORDER **Ostracodermi.**

### FAMILY **OSTRACIIDAE.**

#### **Ostracion (Artedi)**, Linnaeus.

*Ostracion*, Artedi, Genera Pisc. p. 55, 1738; Linn. Syst. Nat. 10th Ed. p. 330, 1758 (many species; first restricted by Swainson to four-angled forms, *cubicus* taken as type); Hollard, Ann. Sci. Nat. 1857, vii, p. 121 *et seq.*; Günth. Cat. Fish. viii, p. 255, 1870; Jord. & Fowler, Japan. Trigger-fishes, in Proc. U.S. Nat. Mus. xxv, 1903, p. 278.

*Tetrosomus*, Swainson, Class'n. Fishes, ii, p. 323, 1839.

*Cibotion*, Kaup. Wiegmann's Archiv. Natur. 1855, p. 214.

*Lactoria*, Jordan & Fowler, t.c.p. 279, 1903.

#### **Ostracion cornutum**, Linn.

(Coffer-fish.)

Willughby, Append. p. 20, no. 12, tab. J13, fig. 1, 1686; Ruysch, Theatr. Univ. pp. 9, 10, 17, tab. 5, figs. 8 and 20; tab. 9, fig. 8, 1718; Valent. De Pisc. Amb. pp. 358, 451, 455, 461, figs. 36, 333, 344, 367; Renard, Poiss. Moluques, i, tab. 39, fig. 197; ii, tab. 8, fig. 38, tab. 13, fig. 60, tab. 27, fig. 135, 1754; Seba, Thes. iii, tab. 24, figs. 8, 9 and 13, 1758.

*Crayracion* no. 26, Klein, Pisc. Miss. iii, p. 22, 1742.

*Ostracion* sp. Gronov. Mus. i, p. 54, no. 118, 1756, and Zoophyl. p. 45, no. 175, 1763.

*Ostracion cornutus*, Linn. Syst. Nat. ed. x, i, p. 331, 1758 (India); Gmel. Linn. Syst. Nat. p. 1443, 1793; Bl. Ichth. i, p. 105, pl. 133, 1797; Lacép. Hist. Nat. Poiss. i, p. 470, 1798 (Indian Seas); Bl. Schn. Syst. Ichth. p. 500, 1801; Shaw, Zool. v, p. 223, pl. clxx, 1803; Schleg. Faun. Japon. Poiss. p. 299, pl. cxxxii, fig. 4, 1850 (Nagasaki), Jerdon, Madras Journ. Lit. Sci. 1851, p. 150; Blkr. Verh. Bat. Gen. xxiv, 1852, Balist. p. 32 (Indian Archipelago), and Atlas Ichth. v, p. 33, pl. ccii, fig. 2 (young), pl. cciv, fig. 3 (adult), 1865; Hollard, Ann. Sc. Nat. 1857, vii, p. 158; Peters, Monatsb. Ak. Wiss. Berlin, 1868, p. 460; Günth. Cat. Fish. viii, p. 265 (Port Natal; Zanzibar; Seychelles; Indian Ocean; Pinang; East Indian Archipelago; Amboyna; Siam; China; Fiji Islds; New Guinea), and Challenger, Shore Fish. pp. 30 and 36, name only, 1880 (Botany Bay; Ovalan); Day, Fish. Ind. p. 697, pl. clxxvi, fig. 4, 1878 (Red Sea;

East coast Africa ; Seas of India to Malay Archipelago and beyond) ; Nystrom, Svensk. Vet. Handl. 1887, p. 47 (Nagasaki) ; Ishikawa, Prel. Cat. p. 3, 1897 (Misaki) ; Jatzow & Lenz, Fische, Ost-Afrik. Madag. und Aldabra, p. 530, 1898 (Zanzibar) ; Gilchr. Cat. Fish. 1902, p. 158 (**S. Africa**) ; Pfeffer, Ost-Afrik., Fische, p. 43, 1903 Zanzibar ; Changu-Riff) ; Regan, Trans. Linn. Soc. Zool. xii, pt. 3, 1908, p. 252 (Cargados, Carajos, 20-30 fms.) ; Gilchr. & Thomp. Ann. S. Afr. Mus. xiii, pt. 3, 1914 (Natal).

*Ostracion arcus*, Bl. Schn. Syst. Ichth. p. 502, 1801 (after *O. quadrangulatus* of Seba) ; Blkr. Atlas Ichth. v. p. 35, pl. ccii, fig. 3 (adult), pl. cciv, fig. 4 (young) 1865 (Java ; Cocos ; Sumatra ; Celebes ; Ternate ; Ceram etc.) ; Günth. Fish. Zanz. p. 129, 1866 (Aden ; Zanzibar ; Seychelles) ; Goode, Proc. U. S. Nat. Mus. 1879, p. 282.

*Lactophyrs cornutus*, Swainson, Fishes, ii, p. 324, 1839 ; Kaup, Sclerod, p. 217.

*Ostracion valentini*, Blkr. Journ. Ind. Archip. 1848 (very young).

*Ostracion cornutum*, Cantor, Cat. Malay. Fish. p. 365, 1849 ; Jord. & Fowler, Jap. Trigger-fishes, in Proc. U. S. Nat. Mus. xxv, 1903, p. 282 (Misaki ; common in East India and Manila) ; Jord. & Seale, Fish. Luzon & Panay, p. 36, 1907 (Cavite) ; Jord. Tan & Synd. Cat. Fish. Japan, p. 223, 1913, (East Indies ; Cavite ; Negros ; Misaki ; Sagami ; Nagasaki).

*Lactoria cornuta*, Jord. & Seale, Fish. Samoa, p. 368, 1906 (Samoa ; Fiji ; Guam ; Marcus Isld. ; New Guinea ; Tahiti and Shortland Isld. ; East Indies ; Japan).

### **Ostracion diaphanus**, Bl. Schn.

? *Ostracion sp.*, Gronov. Zoophyl. p. 45, no. 176, 1763,

*Ostracion diaphanus*, Bl. Schn. Syst. Ichth. p. 501, 1801 (no locality stated) ; Blkr. Act. Soc. Sc. Indo. Nederl. iii, 1857, Japan iv, p. 38, and Visch. v. d. Kaap, p. 57, name only, 1860 (**Cape Seas**) ; Hollard, Ann. Sc. Nat. 1857, viii, p. 157 ; Günth. Cat. Fish. viii, p. 264, 1870 (**Cape of Good Hope** ; Japan ; Pacific) ; Ishikawa, Prel. Cat. 1897, p. 3 (Kagoshima, Sagami) ; Gilchr. Cat. Fish. 1902, p. 159 (**S. Africa**) ; Gilchr. & Thomp. Ann. S. Afr. Mus. xiii, pt. 3, 1914, p. 91 (Natal).

*Ostracion pentacornis*, Bennett, Whaling Voy. p. 266, 1840.

*Ostracion undecimaculeatus*, Smith. Ill. Zool. S. Africa pl. xvii, 1849 (**Cape of Good Hope**) ; Cast. Mem. p. 78, 1861 (**Algoa Bay**).

*Ostracion brevicornis*, Schleg. Faun. Japon. Poiss. p. 297, pl. cxxx, fig. 3, 1850 (Nagasaki).

*Lactophyrs diaphanus*, Kaup, Arch. Naturgesch. 1855, p. 217. [C.P. 3—1918]

*Ostracion (Acanthostracion) cornutus*, Blkr. Atlas Ichth. v., p. 33, pl. ii, fig. 2; pl. iv, fig. 3, 1865 (Amboyna; Nagasaki), not of Linnaeus, according to Peters, Monatsb. Ak. Wiss. Berlin, 1868, p. 461.

*Ostracion diaphanum*, Jord. & Fowler, Jap. Trigger-fishes, in Proc. U. S. Nat. Mus. xxv, 1903, p. 281 (common throughout the East Indies, ranges occasionally northward in the Kuro Shivo to Japan); Jord. Tan. & Snyd. Cat. Fish. Japan, p. 223, 1913 (East Indies; Nagasaki; Misaki, Sagami).

### **Lactophrys**, Swainson.

*Ostracion*, part, Linnaeus, Syst. Nat. Ed. x, p. 330, 1758 (many species; first restricted by Swainson to 4-angled forms, *cabicus* taken as type); Günth. (part), Cat. Fish. viii, p. 255, 1870.

*Lactophrys*, Swainson, Nat. Hist. Class'n. Fishes, ii, pp. 194 and 324, 1839 (restricted to species trigonal, with spines); Jord. & Everm. Fish. N. and Mid. Amer. p. 1721, 1898.

*Rhinesomus*, Swainson, t.c.p. 194, 1839.

*Ostracion*, Kaup, Archiv. Naturg. 1855, p. 214 (restricted to trigonal forms, the 4-angles forms being named Cibrotion).

*Acanthostracion*, Bleeker, Atlas Ichth. v, p. 27, 1862.

*Loetophrys*, Bleeker, t.c.p. 27, 1862 (corrected spelling).

*Chapinus*, Jordan & Evermann, Check-List Fishes N. and Mid. Amer. p. 424, 1896.

### **Lactophrys concatenatus**, Bl.

*Ostracion concatenatus*, Bl. Fische taf. 131 (adult) 1795 (Martinique); Lacép. Hist. Nat. Poiss. i, p. 454, 1898 (no locality stated; after a drawing by Plumier described by Bloch); Bl. Schn. Syst. Ichth. p. 498, 1801; Hollard, Ann. Sc. Nat. 1857, vii, p. 155, Blkr. Visch. v. d. Kaap, p. 57, name only, 1860 (**Cape Seas**); Günth. Cat. Fish. viii, p. 259, 1870 (**Cape of Good Hope**; Zanzibar; Chinese Seas; ? Siam; New South Wales); Gilchr. Cat. Fish. 1902, p. 158 (**S. Africa**); Regan, Trans. Linn. Soc. Zool. xii, pt. 3, 1908, p. 252 (Seychelles Group, Amirante 30 fms; Cargados Carajos, 20-30 fms.); Gilchr. & Thomp. Ann. S. Afr. Mus. xiii, pt. 3, 1914, p. 92 (off Natal coast, 20 fms. immature).

*Ostracion stellifer*, Bl. Schn. t.c.p. 98 (young).

*Ostracion bicuspis*, Blumenbach, Abbild. 1810, taf. 58; Smith Ill. Zool. S. Afr. Pisces, pl. 18, 1849 (**Seas of Southern Africa** and found more frequently in the bays of the South-eastern coast); Cast. Mem. p. 78, 1861 (**Cape Seas**).

DIVISION **GYMNODONTES.**FAMILY **TETRODONTIDAE.****Spheroides**, Lacép.

*Crayracion*, Klein, Pix Missus, ii, p. 18, 1742 (non-binomial).  
*Les spheroides*, Lacép. Hist. Nat. Poiss. ii, p. 1, 1800.  
*Spheroides*, Dumeril, Zool. Analytique, 1806, p. 342; Jord. & Everm. Fish. N. and Mid. Amer. p. 1729, 1898; Jord. & Snyd. Gymnodont Fish. Japan, in Proc. U.S. Nat. Mus. xxiv, 1902, p. 231.  
*Orbidus*, Rafinesque, Anal. de la Nature 1815, p. 90 (substitute for *Les spheroides*, Lacép.).  
*Sphaeroides*, Lacép. Pillot edition Hist. Nat. Poiss. vi, p. 279, 1831.  
*Lagocephalus*, Swainson, Nat. Hist. Class'n Fish. ii, pp. 194 and 328, 1839; Jord. & Everm. Fish. N. and Mid. Amer. p. 1727, 1898.  
*Cirrhismus*, Swainson, t.c. pp. 194 and 328, 1839.  
*Chirlichthys*, Muller, Abhandl. Akad. Wiss. Berlin, 1839 (1841), p. 252.  
*Physogaster*, Muller, t.c.p. 252 (name pre-occupied).  
*Gastrophysus*, Muller, Wiegmann's Archiv, ix, 1843, p. 330.  
*Holacanthus*, Gronov. Syst. ed. Gray, p. 23, 1854 (includes all *Tretodontidae* and *Diodontidae*; name pre-occupied).  
*Anchisomus*, Kaup M. S., Richards. Voy. *Herald*, pp. 156 and 162, 1854.  
*Les stenometopes* (*Stenometopus*), Bibron, Revue Zool. 1855, p. 279.  
*Geneion Catophryncus*, Les promecocephales (Promecocephalus) Bibron, t.c.p. 279.  
*Aspicephalus*, Hollard Etudes sur les Gymnodontes in Ann. Sc. Nat. Series 4, viii, 1857.  
*Tetrodon* (part.) Günth. Cat. Fish. viii, p. 271, 1870.  
*Liosaccus*, Günth. t.c.p. 287.

**Spheroides blochii**, Cast.

*Tetraodon blochii*, Casteln. Mém. p. 75, 1861 (**Kalk Bay**); Günth. Cat. Fish. viii, p. 271, foot-note, 1870 (**Kalk Bay, S. Africa**); Gilchr. Cat. Fish. 1902, p. 160 (**S. Africa**).

**Spheroides cutaneus**, Günth.

*Tetrodon cutaneus*, Günth. Cat. Fish. viii, p. 287, 1870 (St. Helena; **Cape of Good Hope?**); Gilchr. Cat. Fish. 1902, p. 160 (**S. Africa**).

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**Spheroides honckenii**, Bl.

(Blaasop ; Toad-fish ; Toby.)

*Tetraodon honckenii*, Bl. Ausl. Fische i, p. 133, tab. 143, 1795 ; Lacép. Hist. Nat. Poiss. i, pp. 475 and 493, 1798 (Japan) ; Bl. Schn. Syst. Ichth. p. 504, 1801 ; Pappe, Synop. 1853, or 2nd ed. pp. 4 and 5, 1866 (Never found in **Table Bay**, but is very common in the bays to the East of it) not of Rüpp. ; Cast. Mém. p. 74, 1861 (**Algoa Bay** ; common in the bays of the South coast of the **Cape Colony**, but never found in **Table Bay** or on the West coast ; specially abundant in **Simons Bay**) ; Blkr. Atlas Ichth. v, Gynodont. p. 60, pl. 2, fig. 2, 1865 ; Kner, *Novara*, Fische, p. 406, 1865 (**Cape of Good Hope**).

*Tetraodon atratus*, Richards. Voy. Samarang, Fish. p. 15, pl. 7, 1848.

*Holacanthus lagocephalus*, Gronov. Syst. ed. Gray, p. 25, 1854 (**Cape of Good Hope**).

*Gastrophysus honckenii*, Blkr. Nat. Tijds. Ned. Ind. vii, 1854, Celebes, v, p. 258, and Visch. v. d. Kaap, p. 57, name only, 1860 (**Cape Seas**).

*Tetrodon honckenii*, Günth. Cat. Fish. viii, p. 276, 1870 (**Cape of Good Hope** ; Borneo ; Celebes ; China), and Fish. Zanzibar, p. 130, 1866 (Zanzibar) ; Gilchr. Cat. Fish. 1902, p. 160 (**S. Africa**) ; Regan, Col. Fish. 1908, p. 247 (Kosi Bay).

**Spheroides lagocephalus**, Linn.

Seba, Thes. iii, pl. 23, fig. 6 (young).

*Tetrodon lagocephalus*, Linn. Amoen. Acad. i, p. 310, tab. 13, fig. 4, 1759, and Syst. Nat. i, p. 410 (not synon.) ; Lacép. Hist. Nat. Poiss. i, p. 495, 1798 (India ; Jamaica ; Nile ; Mediterranean, and shores of Africa) ; Pennant, British Zoology, ed. 1812, iii, p. 174, pl. 23 ; Günth. Cat. Fish. viii, p. 273, 1870 (British coast ; open ocean ; Lat. 20° N., Long. 22° 53' W. (very young examples) ; **Algoa Bay** ; **S. Africa** ; Mauritius) ; Gilchr. Cat. Fish. 1902, p. 161 (**S. Africa**).

*Tetrodon laevigatus*, Pennant, British Zool. iii, p. 132, pl. 20, 1769.

*Tetrodon stellatus*, Donovan, British Fish. iii, pl. 66, 1808 ; Turton, British Faun. p. 116, 1807 ; Fleming, British Anim. p. 174, 1828 ; Jenyns, Man. p. 489, 1835.

*Lagocephalus pennantii* (Swainson) Bonap. Faun. Ital. 1841.

*Tetrodon pennantii*, Yarrell, British Fish. 2nd ed. ii, p. 457, 1841 ; Couch, Fish. British Islds. iv, p. 373, pl. 244, 1865.

**Spheroides lunaris.** Bl. Schn.

*Tetrodon lunaris*, Bl. Schn. Syst. Ichth. p. 505, 1801 (Malabar) Russell, Fish. Vizagapatam, i, p. 20, pl. 29, 1803; Rüpp. N.W. Fische, p. 59, 1838; Cantor, Cat. Malay. Fish. p. 378, 1849 (Pinang); Blkr. Verh. Bul. Grn. xxiv, 1852, Blootk. p. 12 (Sunda-Molucca Archipelago), xxv, 1853, Bengal, p. 78, and Atlas Ichth. v, 1865, Gymnodont. p. 63, pl. 1, fig. 2; Jerdon, Madras Journ. Lit. and Sc. 1851, p. 150; Günth. Fish. Zanz. p. 131, 1866 (Zanzibar) and Cat. Fish. viii, p. 274, 1870 (**Cape Seas**; Zanzibar; East Indian Archipelago; Penang; Sarawak; China); Klunz. Fische Roth. Meer. 1871, p. 639; Day, Fish. Ind. p. 701, pl. clxxxii, fig. 2, 1878 (Madras; the fry are common in the Hooghly); Gilchr. Cat. Fish. 1902, p. 161 (**S. Africa**).

*Tetrodon tēpa*, Ham. Buch. Fish. Ganges, pp. 10 and 362, 1822. *Tetrodon leiopleura*, Gray, Ill. Ind. Zool. 1834.

*Physogaster lunaris*, Müll. Abhandl. Ak. Wiss. Berlin, 1839, p. 252.

*Gastrophysus lunaris*, Bibron, Rev. Zool. 1855, p. 279.

*Tetrodon (Lagocephalus) lunaris*, Steindr. Fische Süd-arab. und Sok. p. 37, 1902 (Sokotra).

*Spheroides lunaris*, Jord. & Seale, Proc. U.S. Nat. Mus. xxviii, 1905, p. 790 (Negros), and Fish. Luzon and Penay, p. 36, 1907 (San Fabian); Jord. & Rich. Fish. Philippine Archip. p. 273, 1908 (Manila; Iloilo).

**Spheroides lunaris.** Schleg. **var spadiceus**, Richards.

(*Channell- or Golden-Toby*.)

*Tetrodon spadiceus*, Richards. Voy. *Sulphur*, Ichth. p. 123, pl. lviii, figs. 4 and 5, 1844 (Canton); Blkr. Atlas. Ichth. v, Gymnodont. p. 64, pl. iii, fig. 1, 1865 (Java; Sumatra; Banka; Borneo; Celebes; Amboyna).

*Tetrodon lunaris*, Schleg. Faun. Japon. Poiss. p. 277, pl. cxxii, fig. 1, 1847 (Nagasaki), probably not of Schneider, 1801; Day, Fish. Malabar, p. 255, 1865; Nystrom, Handl. Svensk. Vet. Ak. 1887, p. 48 (Nagasaki); Ishikawa, Prel. Cat. p. 1, 1897 (Boshu, Tokyo).

*Tetrodon lunaris, var spadiceus*, Günth. Cat. Fish. viii, p. 275, 1870 (Vizagapatam; coast of Malabar; Borneo; East Indian Archipelago; Philippine Islds.; China; Japan); Gilchr. and Thomp. Ann. S. Afr. Mus. vi, pt. 3, 1909, p. 274 (Natal, common in Durban Bay, in deep water).

*Lagocephalus lunaris*, Waite, Mem. Austral. Mus. iv, 1899, p. 97 (Newcastle, New South Wales, 16-32 fms.).

*Spheroides spadiceus*, Jord. & Snyd. Proc. U.S. Nat. Mus. xxiv, 1902, p. 234 (East Indies, north to Japan; rather common); Jord. Tan. & Snyd. Cat. Fish. Japan, p. 224, 1913 (East Indies, north to Japan; Canton); Seale, Cat. Fish. Hongkong, p. 74, 1914.

**Tetraodon**, Linn.

*Tetraodon*, Linn. Syst. Nat. 10th ed. p. 332, 1758; Jord. & Snyd. Proc. U.S. Nat. Mus. xxiv, 1902, p. 249.

*Les Ovoides*, Lacép. Hist. Nat. Poiss. i, p. 256, 1798 (based on front view of *Tetraodon stellatus*).

*Ovum*, Bl. Schn. Syst. Ichth. p. 530, 1801, after Lacépède.

*Ovoides*, Dumeril, Zool. Analytique, 1806, after Lacépède.

*Oonidus*, Rafinesque, Anal. de la Nature, p. 90, 1815 (substitute for *Ovum*).

*Arothron*, Müller, Abhandl. Berlin Akad. 1839, p. 252.

*Les Epipedorhynques* (Epipedorhynchus), Bibron, Revue Zool. 1855, p. 279.

*Les Dichotomycères* (Dichotomycter), Bibron, l.c.

*Les Dilobomyctères* (Dilobomycterus), Bibron, l.c.

*Crayracion*, Bleeker, Atlas Ichth. v. Gymnodontes, p. 65, 1865, after Klein, 1742.

*Brachycephalus*, Hollard, Gymnodontes, p. 324, 1867.

*Tetraodon*, Günth. (part.), Cat. Fish. viii, p. 271, 1870; Blgr. Poiss. Buss. Congo. p. 502, 1901, and also Fish. Nile, p. 543, 1907, and Freshw. Fish. Afr. iv, p. 142, 1916; Regan, P.Z.S. 1902, p. 294.

## FAMILY DIODONTIDAE.

**Diodon**, Linnaeus.

*Ostracion* sp., Artedi, 1738.

*Diodon*, Linnaeus, Syst. Nat. 10th Ed. p. 335, 1758; Günth. Cat. Fish. viii, p. 306, 1870; Jord. & Everm. Fish. N. and Mid. Amer. p. 1746, 1898; Jord. & Snyder, Proc. U.S. Nat. Mus. xxiv, 1902, p. 256.

*Paradiodon*, Bleeker, Atlas Ichth. v. 1865, Gymnodontes, p. 56 (name a substitute for *Diodon*, transferred to another genus).

**Diodon holacanthus**, Linn.

*Ostracion oblongus holacanthus*, Artedi, Genera, p. 60, no. 20, 1738 (India).

*Crayracion*, nos. 9 and 15, Klein, Pisc. Miss. iii, pp. 19 and 20, pl. 3, fig. 6, 1740.

*Diodon holocanthus*, Linn. Syst. Nat. 10th Ed. p. 335, 1758 (India), based on Artedi, misprint for *holacanthus*.

*Diodon holacanthus*, Jord. & Everm. (part.), Fish. N. and Mid. Amer. p. 1746, 1898 (in all warm seas); Everm. & Marsh (part.), Fish. Porto Rico, in Bull. U.S. Fish. Comm. xx, pt. 1, 1900, p. 271 (Guanica Bay, Porto Rico); Jord. & Snyder (part.), Proc. U.S. Nat. Mus. xxiv, 1902, p. 257 (in all warm seas); Jord. & Everm. Proc. U.S. Nat. Mus. xxv, 1903, p. 361 (Hokkaido, Formosa); Jord. Tan. & Snyd. Cat. Fish. Japan, p. 230, 1913 (Laysan);

Sulu Sea ; Nagasaki to Misaki, Sagami ; all warm seas), and Fish. Hawaiian Islds. in Bull. U.S. Fish. Comm. xxiii, pt. i, 1903 (1905), p. 436 (in all warm seas, its range coinciding with *D. hystrix*, from which it may prove to be not distinct).

*Diodon spinosissimus*, Cuv. Mem. Mus. Hist. Nat. iv, 1818, p. 134 (no locality stated) ; Günth. Cat. Fish. viii, p. 307, 1870 (**Cape of Good Hope** ; Siam) ; Gilchr. Cat. Fish. 1902, p. 160 (**S. Africa**).

*Diodon melanopsis*, Kaup. Wieg. Arch. 1855, p. 228.

### **Diodon hystrix**, Linn.

(*Porcupine-fish* ; *Zee-vark*.)

*Orbis echinatus*, Rondel. De Pisc. p. 324, 1558 (Northern Ocean).

*Histrix pisces*, Clusius, Exot. vi, cap. 23, 1605 ; Jonston, l.c. tab. 3, fig. 1, 1649.

*Guamajacu guara*, Marg. Hist. Nat. Brazil, p. 159, 1649 (Brazil).

*Ostracion conico oblungus*, Artedi, Genera, p. 60, no. 19, 1738, and Synon. p. 86, no. 21, 1738.

*Crayracion* sp. Klein, Pisc. Miss. iii, p. 20, nos. 13 and 14, 1742.

*Ostracion* sp., Gronov. Mus. ii, p. 40, no. 181, 1756, and Zoophil. p. 47, no. 181, 1763.

*Erizo*, Parra, Descr. Dif. Piezas Hist. Nat. Cuba, p. 60, pl. 29, fig. 1, 1787 (Havana).

*Diodon hystrix*, Linn. Syst. Nat. 10th Ed. p. 335, 1758 (India) ; Bl. Ichth. pl. cxxvi, 1787 ; Bris de Barnev. Rev. Zool. 1846, p. 141 ; Jerdon, Madras Journ. Lit. and Sc. 1851, p. 150 ; Cast. Mem. p. 74, name only, 1861 (**Cape Seas**) ; Günth. Cat. Fish. viii, p. 306, 1870 (Gaboon ; Fernando Po ; Calabar ; West Indies ; Jamaica ; **Cape Seas** ; Indian Ocean ; Amboyna ; Society Islds.), and Challenger, Shore Fishes, p. 58, name only, 1880 (Tahiti) ; Klunz. Fische Roth. Meer. 1871, p. 647 ; Day, Fish. Ind. p. 708, pl. clxxix, fig. 4, 1878 (Andamans ; Red Sea ; through seas of India to Malay Archipelago and to Pacific) ; Jord. & Gill. Synops. p. 863, 1883 ; Jord. & Rutter, Proc. Ac. Nat. Sc. Philad. 1897, p. 130 ; Jord. & Everm. Fish. N. and Mid. Amer. p. 1745, 1898 (Tropical seas, everywhere common ; north to Lower California, Florida, and the Hawaiian Islds. ; Seale Fish. Guam. in Occ. papers Bishop Mus. i, pt. 3, 1900, p. 120 (Marianas ; Seas of India ; Western Pacific) ; Everm. & Marsh Fish. Porto Rico, in Bull. U.S. Fish. Comm. xx, pt. 1, 1900, p. 271 (tropical seas, common, north to Lower California, Florida and Hawaiian Islds. ; Jamaica ; Porto Rico) ; Delfin. Cat. Pecis. Chile, p. 77, 1901 (Pascua

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Istd. ; coasts of Sinaloa and Bay of California) ; Gilchr. Cat. Fish. 1902, p. 160 (**S. Africa**) ; Steindr. Fische Süd-arab. und Sokotra, p. 38, 1902 (Makalla) ; Jenkins Bull. U.S. Fish. Comm. xxii, 1902 (1903), p. 489 (Honolulu) ; Jord. & Everm. Fish. Hawaiian Islds. in Bull. U.S. Fish. Comm. xxiii, pt. 1, 1903 (1905), p. 437, fig. 192 (occasionally taken among the Hawaiian Islds.) ; Jord. & Seale, Fish. Samoa, p. 373, 1906 (Samoa ; Tahiti ; Hawaii ; Guam ; Johnston Isld. ; New Guinea ; all warm seas).

*Diodon atinga*, Bl. Ichth. iv, p. 75, pl. 125, 1787 (not of Linnaeus) ; Bl. Schn. Syst. Ichth. p. 511, 1801 ; Lacép. Hist. Nat. Poiss. i, pl. xxv, fig. 3 and ii, pp. 1 and 2, 1800 (Seas of India and America, near the Tropics, and in neighbourhood of **Cape of Good Hope**) ; Rüpp. Senck. Mus. Fische p. 35, 1852 ; Kaup, Wieg. Arch. 1855, p. 227 (not Linnaeus) ; Blkr. Enum. Pisc. p. 203, 1859 and Visch. v. d. Kaap, p. 57, name only, 1860 (**Cape Seas**) ; Cast. Mem. p. 74, name only, 1861 (**Cape of Good Hope**).

*Diodon plumieri*, Lacép. i, pl. 3, fig. 3, 1798 and ii, pp. 1 and 10, 1800 (Martinique) on a drawing by Plumier.

*Diodon brachiatus*, Bl. & Schn. Syst. Ichth. p. 513, 1801 (Cuba) after Parra.

*Diodon punctatus*, Cuv. Mem. Mus. Hist. Nat. iv, 1818, p. 132 (no locality stated) ; Blkr. Verh. Bat. Grn. xxiv, 1852, Blootk. p. 19 (Sunda-Molucca Archipelago).

*Diodon echinus* (Rafinesque) Bonap. Cat. Met. Pisc. Eur. p. 87, 1846. (Mediterranean Sea, no description).

*Holocanthus hystrix*, Gronov. Syst. ed Gray, p. 27, 1854 (Atlantic and Pacific Oceans).

*Paradiodon hystricis*, Blkr. Atlas Ichth. v, Gymnod. p. 56, pl. 3, fig. 2, 1865 (Dutch East Indies) ; Poey, Fauna, Puerto Requena, p. 346, 1881.

### **Diodon maculatus.** Lacép.

Le *Diodon tacheté*, Lacép. Hist. Nat. Poiss. ii, p. 13, 1800 (New Cytherea).

? *Diodon liturosus*, Shaw, Gen. Zool. v, p. 436, pl. 2, 1804 (after *D. tacheté*, Lacép.)

*Diodon multimaculatus*, Cuv. Mem. Mus. Hist. Nat. iv, 1818, p. 136 (no locality stated).

*Diodon sexmaculatus*, Cuv. t.c.p. 136, pl. 7 (no locality stated) ; Blkr. Visch. v. d. Kaap, p. 57, name only, 1860 (**Cape Seas**) ; ? Günth. Fish. Cent. Amer. p. 396, 1869 ; Steindr. Denks. Ak. Wiss. Wien, 1900 p. 518 (Laysan).

*Diodon maculatus*, var.  $\delta$ , Günth. Cat. Fish. viii, p. 308, 1870 (West Indies ; **Cape of Good Hope** ; Bourbon ; Formosa), based on *D. tacheté*, Lacép. ; Gilchr. Cat. Fish. 1902, p. 159 (**S. Africa**).

*Diodon holacanthus*, Jord. & Everm. (part.) Fish. N. and M d. Amer. p. 1746, 1898 (in all warm seas) ; (part.) Fish.

Hawaian Islds. in Bull. U. S. Fish. Comm. xxiii, pt. i, 1903 (1905) p. 436 (in all warm seas); Everm. & Marsh (part.), Fish. Porto Rico, in Bull. U. S. Fish. Comm. xx, pt. i, 1900, p. 271 (in all warm seas); Jord. & Snyd. (part.) Proc. N. S. Nat. Mus. xxiv, 1902, p. 257 (in all warm seas); Jord. & Seale, Fish. Samoa, p. 373, 1906 (Laysan; warm seas).

### **Diodon maculifer**, Kaup.

? *Diodon hystrix*, Bl. Ichth. taf. 126, 1787 (not of Linnaeus).  
 ? *Diodon holacanthus*, Lacép. ii, p. 11, 1800, after Bloch.

*Diodon maculifer*, Kaup, Wieg. Arch. 1855, p. 229 (**Cape of Good Hope**); Blkr. Visch. v. d. Kaap, p. 57, name only, 1860 (**Cape Seas**); Günth. Cat. Fish. viii. p. 309, 1870 (**Cape of Good Hope**; ? Cuba); Jord. & Everm. Fish. N. and Mid. Amer. p. 1747, 1898 (**Cape of Good Hope**); Gilchr. Cat. Fish. 1902, p. 160 (**S. Africa**).

### **Chilomycterus.**

*Chilomycterus*, Bibron, in Barneville, Revue Zool. p. 40, 1846; Kaup. Wieg. Archiv. 1847, p. 365; Günth. Cat. Fish. viii, p. 309, 1870; Jord. & Everm. Fish. N. and Mid. Amer. p. 1747, 1898; Jord. & Snyd. Proc. U. S. Nat. Mus. xxiv, 1902, p. 258.

*Cyclichthys and Cyainchthys*, Kaup. Wieg. Archiv. 1855, p. 231.

*Diodon*, Bleeker, Atlas Ichth. Gymnod. p. 55, 1865 (not *Diodon*, as earlier restricted by Kaup to *Diodon hystrix*).

### **Chilomycterus antennatus**, Cuv.

*Diodon antennatus*, Cuv. Mem. Mus. Hist. Nat. iv, 1818, p. 131, pl. 7; Jenyns, Zool. Beagle, Fish. p. 151, 1842.

*Chilomycterus antennatus*, Kaup. Wieg. Archiv. 1855, p. 232; Günth. Cat. Fish. viii, p. 311, 1870 (St. Croix; Jamaica; **Cape of Good Hope**); Jord. & Everm. Fish. N. and Mid. Amer. p. 1750, 1898 (West Indies and southward; recorded from St. Croix, Jamaica, Porto Rico, and **Cape of Good Hope**); Everm. & Marsh, Fish. Porto Rico, in Bull. U. S. Fish. Comm. xx, 1900, p. 273, pl. 42 (Mayaguez; San Geronimo); Gilchr. Cat. Fish. 1902, p. 159 (**S. Africa**).

*Chilomycterus puncticulatus*, Poey, Anal. Hist. Nat. p. 346, 1881 (Porto Rico).

### **Chilomycterus echinatus**, Gronov.

Seba, Thes. iii, xxiii, fig. 3, 1758.

*Ostracion* sp. Artedi, Gen. p. 60, no. 18, 1738.

*Diodon hatinga*, var.  $\gamma$ , Linn. Syst. Nat. i, p. 413.

*Holacanthus echinatus*, Gronov. Syst. ed. Gray, p. 27, 1854  
(Atlantic and Pacific Oceans).

*Cyclichthys orbicularis*, Kaup, Wieg. Archiv. 1855, p. 231  
(not of Bloch).

*Chilomycterus echinatus*, Günth. Cat. Fish. viii, p. 312, 1870  
(**Cape of Good Hope**) ; Gilchr. Cat. Fish. 1902, p. 159  
(**S. Africa**).

### **Chilomycterus orbicularis**, Bl.

*Diodon orbicularis*, Bl. Ichth. tab. 127, 1787 ; Lacép. Hist. Nat. Poiss. p. 16, 1800 (Rio Janeiro) Bennett, Whaling Voy. ii, p. 264, 1840 ; Barneville, Rev. Zool. 1846, p. 141 ; Blkr. Nat. Tijds. Ned. Ind. v, 1853, p. 92 (Solor), Act. Soc. Sc. Indo-Neerl. ii, 1857, Amboina viii, p. 95 Visch. v. d. Kaap, p. 57, name only, 1860 (**Cape Seas**) and Atlas Ichth. v, Gymnod. p. 55, pl. 1, fig. 4, 1865 ; Cast. Mem. p. 74, 1861 (**Cape of Good Hope**).

*Diodon coeruleus*, Quoy & Gaim. Voy. *Uranie*, Poiss. p. 201, pl. 65, fig. 5, 1824 (young).

*Diodon triedricus*, Cantor, Cat. Malay. Fish. p. 371, 1849 (not Cuv.).

*Chilomycterus orbicularis*, Günth. Cat. Fish. viii, p. 312, 1870 (Pinang ; Ceram ; East Indian Archipelago ; Indian Ocean) ; Gilchr. Cat. Fish. 1902, p. 159 (**S. Africa**).

### **Chilomycterus spinosus**, Linn.

*Guamajacu atinga*, Marcgr. Hist. Brasil. p. 168, 1648 (Brazil).

*Orbis muricatus*, Ranoe *rictu* *Guamiacu Atinga*, Willughby, Hist. Pisc. p. 145, 1686 (Brazil) description copied from Marcgrave but with a new figure representing *Chilomycterus schoepfi*.

*Atinga alter minor orbicularis* (Lister) Willughby, t.c.p. 155, 1686.

*Ostracion subrotundus ventre glabro*, Artedi, Gen. p. 59, no. 15, 1738.

*Diodon spinosus*, Linn. Syst. Nat. 10th ed. p. 335, 1758 (India) based on Artedi.

*Toad-fish*, Schoepff, in Schrift. Ges. ntrf. Freund. Berlin, viii, 1788, p. 192 (Long Isl.).

*Diodon schoepfi*, Walbaum, t.c.p. 602, 1792 (no locality stated).

*Le Diodon orbe*, Lacép. Hist. Nat. Poiss. ii, p. 16, 1800 (Rio Janeiro).

*Diodon geometricus*, Bl. Schn. Syst. Ichth. p. 513, pl. 96, 1801 (America).

*Diodon geometricus*, var. *lineatus*, Bl. Schn. t.c.p. p. 513, 1801 (New York) after Schoepf.

*Diodon maculato-striatus*, Mitchell, Trans. Lit. and Phil. Soc. New York, i, 1814, p. 470, pl. 6, fig. 3 (New York) ; Dekay, New York Faun. Fish. p. 323, pl. 56, fig. 185, 1842.

*Diodon rivulatus*, Cuv. Mem. Mus. Hist. Nat. iv, 1818, p. 129, pl. 6 (New York) after Mitchell; Jenyns, Zool. *Beagle*, Fish. p. 150, 1842.

*Diodon nigrolineatus*, Ayres, Journ. Boston Soc. Nat. Hist. iv, 1842, p. 68 (Brook Haven, Long Isld.).

*Diodon fuliginosus*, Dekay, t.c.p. 324, pl. 55, fig. 181, 1842 (New York), young.

*Diodon verrucosus*, Dekay, t.c.p. 325, pl. 56, fig. 184, 1842 (New York), young.

*Holocanthus areolatus*, Gronov. Syst. ed. Gray, p. 27, 1854 (**Cape of Good Hope**).

*Cyclichthys cornutus*, Kaup, Wieg. Archiv. 1855, p. 231 (Bahia).

*Chilomycterus geometricus*, Kaup, t.c.p. 232; Günth. Cat. Fish. viii, p. 310, 1870 (**Cape Seas**; Bahia; Brazil; Trinidad; Cuba; Lake Champlain; Pontchartrain Lake, Texas, U.S. America); Gilchr. Cat. Fish. 1902, p. 159 (**S. Africa**).

*Chilomycterus schoepfi*, Jord. & Everm. Fish. N. and Mid. Amer. p. 1748, 1898 (Cape Cod to Florida; very abundant southward in shallow water; especially numerous on the coast of the Carolinas and Florida).

*Chilomycterus spinosus*, Jord. & Everm. t.c.p. 1749, 1898 (West Indies; coast of Brazil).

### **Dicotylichthys**, Kaup.

Kaup, in Wiegmann's Archiv, 1855; Günth. Cat. Fish. viii, p. 314, 1870.

### **Dicotylichthys punctulatus**. Kaup.

Kaup, Wieg. Arch. 1855, p. 230; Günth. Cat. Fish. viii, p. 315, 1870 (**Cape of Good Hope**; ? Mauritius; Sydney); Waite, Thetis, Mem. Austral. Mus. iv, 1898, p. 98, pl. xix (Newcastle Bight, Australia); Gilchr. Cat. Fish. 1902, p. 159 (**S. Africa**).

## FAMILY MOLIDAE.

### **Mola**, Linck.

*Mola*, Linck, Mag. neueste Roysik. Naturgeschichte 1790, p. 37; Cuvier, Tableau Elém. Hist. Nat. Animaux, p. 323, 1798; Jord. & Everm. Fish. N. and Mid. Amer. p. 1753, 1898; Jord. & Snyd. Proc. U.S. Nat. Mus. xxiv, 1902, p. 260.

*Orthragoriscus*, Bl. Schn. Syst. Ichth. p. 510, 1801 (misprint for *Orthagoriscus*).

*Cephalus*, Shaw, Gen. Zoology v, pp. 2 and 432, 1804.

*Orthragus*, et *Diplandrias*, Rafinesque, Caratteri Alc. nuovi Generi etc. della Sicilia, p. 17, 1810.

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*Tympanomium, Trematopsis, et Ozodura*, Ranzini, Novi Comm. Ac. Sci. Bonon. v, 1837, p. 3, pl. after p. 81.

*Pedalion* (Guilding M. S.) Swainson, Nat. Hist. and Class'n. Fishes, v, i p. 199, ii pp. 195 and 329, 1839; Casteln. Mém. Poiss. Afrique Aust. p. 75, 1861.

*Aledon*, Casteln. t.c.p. 76, 1861.

*Orthagoriscus*, Günth. Cat. Fish. viii, p. 317, 1870.

*Larval forms.*

*Molacanthus*, Swainson, t.c. ii pp. 195 and 329, 1839.

*Pallasia*, Nurdo, Ann. Sci. Regno. Lombard. Venet. v, 1840, pp. 10 and 12.

*Acanthosoma*, Dekay, New York Fayna, Fishes, p. 330, 1842.

*Centaurus*, Kaup, Archiv. Naturgesch. i, 1855, p. 221.

**Mola mola**, Linn.

(*Sun-fish.*)

*Orthragoriscus* or *Luna piscis*, Rondel. de Pisc. p. 424, 1554; Gesner, p. 640, 1558.

*Mola*, Salvian. Aquat. fo. 155, 1554; Aldrov. De Pisc. p. 412, 1638; Jonston, Hist. Nat. i, tit. i, cap. 3, tab. 9, fig. 2, 1649; Willughby, Hist. Pisc. p. 151, tab. J26, 1686; Jan. Planc. Comm. Inst. Bonon. iii, p. 331, tab. 8, Borlase, Cornwall, p. 268, tab. 26, fig. 7, 1758; Brünn. Pisc. Massil. p. 8, 1768; Dousma, Verh. Maatsch. Weet. Haarlem, xii, 1770, p. 413, c. tab.; Houttuyn, Natuurl. Hist. i, tab. 68, fig. 7.

*Ostracion catheoplatus subrotundus*, Artedi, grn. p. 61, no. 22, Synon. p. 83, no. 4, 1738.

*Ostracion* sp. Gronov. Zoophyl. nos. 185 and 186, 1763.

*Tetronodon mola*, Linn. Syst. Nat. 10th ed. pp. 334 and 412, 1758 (Mediterranean), after Artedi; Retz. Vet. Ac. Nya Handl. vi, 1785, p. 115, tab. 4; Donovan, British Fish. ii, p. 25, 1808; Home, Lect. Compar. Anat. vi, pls. 50 and 51.

*Mola aculeata*, Kolreuter, Nov. Comm. Petropol. x, 1766, p. 337, pl. viii, figs. 2 and 3.

*Short Diodon*, Pennant, British Zool. iii, p. 131, pl. 19, 1769.

*Short Tetronodon*, Pennant, t.c. ed. 1812, iii, p. 172, pl. 22.

*Mole Duhamel*, Pesches, ii, sect. ix, p. 306, p. 23, 1769.

*Diodon mola*, Bl. Ausl. Fische, i, p. 75, t. 128, 1785.

*Tetronodon lune*, Lacép. Hist. Nat. Poiss. i, p. 509, 1798 (Mediterranean; the Ocean, all latitudes from the **Cape of Good Hope** to the northern boundary of the North Sea).

*Mola rotunda*, Cuv. Tabl. Elém. Nat. Hist. p. 323, 1798, after *Tetronodon mola* of Linnaeus.

*Orthagoriscus mola*, Bl. Schn. Syst. Ichth. p. 510, 1801; Fleming, British Anim. p. 175, 1828; Jenyns, Man. p. 490, 1835; Nilss. Skand. Faun. Fisk. p. 697, 1836; Kröyer

Danm. Fisk. iii, p. 732, 1838; Storer, Massach. Reports, p. 170, pl. 3, fig. 1, 1839 and Mem. Amer. Acad. viii, p. 420, pl. 34, fig. 2; Bellingham, Mag. Nat. Hist. 1840, p. 235; Bennett, Whaling Voy. ii, p. 262, 1840; Wellenbergh Observ. anatom. de O.M. Ludg-Batav. 1840; Yarrell, British Fish. 2nd ed. ii, p. 462, 1841, and 3rd ed. ii, p. 432, 1859; Parnell, Werner. Mem. vii, p. 401, Dekay, New York Faun. Fish. p. 331, pl. 59, fig. 193, 1842; Schleg. Faun. Japon. Poiss. p. 288, tab. 127, 1850 (Nagasaki) and pl. cxxvii; Cast. Mem. p. 75, 1861 (occasionally at the **Cape of Good Hope**); Goodsir, Edinb. Philos. Journ. xxx, p. 188; Cleland, Nat. Hist. Review, 1862, p. 183; Costa, Faun. Regn. Napol. Pesc. tav. 63 and 64; Günth. Cat. Fish. viii, p. 317, 1870 (British Coasts; Adriatic; North Atlantic; a pelagic fish, probably inhabiting most of the seas of the temperate and tropical regions); Day, British Fish. ii, p. 272, pl. cxlviii, 1884; Pr. Albert de Monaco, Extr. Bull. Soc. Zool. Franc. xiv, pl. 16, 1889; Philippi, An. Mus. Nac. Chile, Zool. p. 15, pl. vi, figs. 2-4, 1892; Herdm. & Daw. Fish. Irish Sea, p. 57, 1902 (visits these (Irish) shores mostly in summer and is commoner in the English Channel than further north, but has been taken in the Clyde); Gilchr. Cat. Fish. 1902, p. 158 (**S. Africa**).

*Orthagoriscus hispidus, fasciatus*, Bl. Schn. Syst. Ichth. p. 511, 1801.

*Cephalus brevis*, Shaw Gen. Zool. v, p. 437, pl. clxxvi, 1804; Turton British Faun. p. 116, 1807; Neill, Werner. Mem. i, p. 546, 1811; Mitchell, Lit. and Phil. Trans. New York, i, p. 471.

*Cephalus pallasianus*, Shaw. t.c.p. 440, 1804.

*Cephalus mola*, Risso, Ichth. Nice, p. 60, 1810; Bonap. Cat. Met. Pesc. Europ. p. 87, 1870.

*Diodon carinatus*, Mitchell, Ann. Lyc. Nat. Hist. New York, ii, 1815, p. 264, pl. v, fig. 1 (New York).

*Orthagoriscus spinosus*, Cuvier, Règne Anim. 1817; Gatchet, Act. Soc. Linn. Bordeaux v, 1832, p. 253 (young); Richards. Voy. *Sulphur*, Fish. p. 125, pl. 62, figs. 10-12, 1845 (young).

*Cephalus orthagoriscus*, Risso, Eur. Mérid. iii, p. 173, 1827.

*Ozodura orsini*, Ranzani, Nov. Comm. Ac. Sci. Bonom. iii, 1839, p. 82 (Mediterranean), also pl. vi.

*Tympanomium planci*, Ranzani, t.c.p. 82, 1839 (Adriatic Sea).

*Diplanchias nasus*, Ranzani, t.c.p. 82, 1839 ("in mare siculus").

*Trematopsis willughbei*, Ranzani, t.c.p. 82, 1839 ("in Oceano").

*Orthagoriscus retzii* (no locality stated) *gluni* (Mediterranean), *rondeletii* (Mediterranean).

*Orthagoriscus blochii* ("in mare oceano"), *alexandrini* (Adriatic), *redi* (Mediterranean).

*Orthagoriscus oculatus* (no locality), Ranzini, t.c.p. 82, 1839.

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*Orthagoriscus elegans, battlarae*, Ranzani, t.c.p. 1839 (Atlantic Ocean ; Adriatic Sea).

*Pallasia pallasi*, Nardo, Ann. Sc. Regno Lombard. Venet. x, 1840, p. 112 (Venice).

*Acanthosoma carinatum*, Dekay, New York Faun. Fish. p. 330, pl. lv, fig. 179, 1842 (young).

*Ostracion boops*, Richards. Voy. *Erebus & Terror*, Ichth. p. 52, 1844 (South Atlantic).

*Orthagoriscus lunaris*, Gronov. Syst. ed. Gray, p. 165, 1854 (Mediterranean).

*Orthagoriscus solaris*, Gronov. t.c.p. 165, 1854 (Mediterranean ; North Sea ; Indian Sea).

*Orthagoriscus analis*, Ayres, Proc. Cal. Ac. Sci. ii, 1854, p. 31, fig. liv (San Francisco).

*Aledon storeri, capensis*, Casteln. Mem. p. 76, 1861 (**Table Bay ; Cape Seas**).

? *Orthagoriscus sp.* Swinhoe, Ann. and Mag. Nat. Hist. xii, 1863, p. 225.

*Mola nasus*, Steenstrup & Lutken, Overs. Dansk. Vid. Selsk. Forh. 1863, p. 36.

*Mola retzii*, Steens. & Lutk. t.c.p. 36, 1863.

*Sun-fish*, Couch, Fish. British Islds. iv, p. 377, pl. 245, 1865.

*Orthagoriscus ozodura*, Harting, Verhand. Ak. Wet. Amsterd. 1868, pp. 1-48, pls. i-viii.

*Mola mola*, Jord. & Everm. Fish. N. and Mid. Amer. p. 1753, 1898 (Pelagic, inhabiting most temperate and tropical seas. Common northward to England, Cape Cod, and San Francisco, rare in the West Indies. The Pacific Ocean form which ranges from San Francisco to Mazattan, seems to be identical) ; Jord. & Snyd., Prel. Check. List, Japan Fish. p. 97, 1901 ; Delfin, Cat. Peces de Chile, p. 77, 1902 (both hemispheres) ; Jord. & Snyd. Gymnod. Fish. Japan, in Proc. U.S. Nat. Mus. xxiv, 1902, p. 260 (Pelagic, Nagasaki ; occasionally northwards to Tokyo, England, Cape Cod, San Francisco ; rare in the West Indies) ; Waite Rec. Canterbury Mus. New Zealand, Vol. i, no. 1, p. 34, 1907 ; Jord. Tan. & Snyd. Cat. Fish. Japan, p. 230, 1913 (Warm seas ; occasionally northwards, etc.).

### Ranzania, Nardo.

*Ranzania*, Nardo, Ann. Sci. Regno Lombard. Venet. v, 1840, pp. 10 and 105 ; Günth. Cat. Fish. viii, p. 319, 1870 ; Jord. & Everm. Fish. N. and Mid. Amer. p. 1755, 1898.

### Ranzania truncata, Retzius.

*Sun-fish* from Mount's Bay, Borlase, Cornwall, p. 268, pl. 26, fig. 7, 1758 ; Couch. Fish. British Isld. iv, p. 381, pl. 246, 1865.

*Mola*, Jan. Planc. Comm. Inst. Bonon. ii, 2, 1766, p. 297, tab. 17.

*Oblong Diodon*, Pennant, British Zool. iii, p. 113, pl. 19, 1769.

*Oblong Tetrodon*, Pennant, t.c. ed. 1812, iii, p. 170, pl. 22.

*Tetrodon truncatus*, Retz. Vet. Ak. Nya. Handl. vi, 2, p. 116, 1785; Gmel. Linn. Syst. Nat. i, p. 1448, 1793; Lacép. Hist. Nat. Poiss. i, p. 514, pl. 22, fig. 2, 1798 (after Commerson); Donovan, British Fish. ii, pl. 41, 1808.

*Orthagoriscus oblongus*, Bl. Schn. Syst. Ichth. p. 511, 1801; Jenyns. Man. p. 491, 1835; Yarrell, British Fish. 2nd ed. ii, p. 469, 1841, or 3rd ed. ii, p. 439, 1859; Blkr. Visch. v. d. Kaap, p. 57, name only, 1860 (**Cape Seas**); Cast. Mem. p. 75, 1861 (**Cape Seas**); Harting, Verhandl. Ak. Wet. Amsterd. 1868, p. 12, pl. 2, fig. 2.

*Cephalus oblongus*, Shaw, Gen. Zool. v, p. 439, pl. 176, 1804; Turton, British Faun. p. 116, 1807.

*Cephalus elongatus*, Risso, Eur. Mérid. iii, p. 173, 1827.

*Orthagoriscus truncatus*, Fleming, British Anim. p. 175, 1828.

*Mola planci*, Nardo, in Féruccac, Bull. Sc. Nat. xiii, 1828, p. 437.

*Cephalus cocherani*, Traill. Werner. Mem. vi, 1832.

*Orthagoriscus varius*, *elegans*, *battarae*, Ranzani, Nov. Comm. Ac. Sc. Inst. Bonon. iii, 1839, p. 80.

*Ranzania truncata*, Nardo, Ann. Sc. Regn. Lombard. Venet. 1840, x, p. 105; Steenstrup. & Lutken, Overs. Dansk. Vid. Selsk. Forh. 1863; Jord. & Gilbert, Synops. p. 966, 1883; Jord. & Everm. Fish. N. and Mid. Amer. p. 1755, 1898 (Pelagic; occasionally off Atlantic coast of N. America; once taken at the Bermudas).

*Orthagoriscus truncatus*, Günth. Cat. Fish. viii, p. 319, 1870 (**Cape Seas**; Sierra Leone; Atlantic; Pacific); Gilchr. Cat. Fish. 1902, p. 159 (**S. Africa**).

## VI. MEMORANDUM ON THE DESIRABILITY OF CONTINUING THE MARINE BIOLOGICAL SURVEY OF THE SOUTH AFRICAN SEAS.

As the potential fishing area in the South African Seas is about 38,000 square miles in extent, and, of this, only a small part has been adequately exploited, it will be seen that there is a source of wealth and food supply entirely untouched on these coasts. To indicate how it is that such a large fishing area has remained unexplored, and how best it may be opened up, is the aim of the following note.

Another practical aspect to which it is desirable to draw attention is the need of further knowledge as to the habits and kinds of fish occurring in the South African Coast. Such knowledge is urgently required in view of several problems, such as the conservation of the diminishing supply of Snoek, the preservation of the now important Crawfish industry, the presence of fish such as the Cape Sardine and Anchovy, which occur, it is believed, in immense quantities in the South African seas, but which are not utilised.

I have referred elsewhere to the previous history of the fishing industry, which has led up to the present state of development, and need only mention here that about forty or fifty years ago the industry was in a very primitive condition, partly due to the fact that there was no ready market nor great demand for fish, and partly due to the primitive methods in which fishing was carried on. At a later date the demand for fish increased with the increase of the white population, and at the same time the inshore fisheries showed signs of becoming exhausted. Under these conditions it is not surprising that the importation of fish from overseas soon increased to an undue extent, and large sums were sent out of the country for fish which might have been procured in South African waters. Thus in the year 1902 well over three hundred thousand pounds value of fish were imported into South Africa from European countries.

In view of this state of affairs, attempts were made to increase the supply of fish by employing more modern methods of fishing and larger boats, which could go further afield to discover and open up new fishing grounds. A number of experienced fishermen were introduced from the North Sea, and settled down at Port Elizabeth. The fishing conditions were, however, so different from those prevalent in European seas and more remunerative employment was so easily found elsewhere that the experiment led to no practical results.

An attempt was also made by a private firm in Cape Town to exploit the resources of the deep sea fishing, more especially of the Agulhas Bank, which was believed to be a fishing ground of great promise. This enterprise was also unfortunately not a financial success and was dropped. From time to time also various experiments in trawling were made at Cape Town, False Bay, Mossel Bay and Port Elizabeth, specially with a view to finding soles, one of the most valuable of food fish. Some soles were indeed found, but not in sufficient quantity to justify the expense of trawling operations. These enterprises were ultimately abandoned, though at Cape Town and Port Elizabeth the harbour tugs in their spare time occasionally continued the trawling for soles, which, being a rarity in South Africa, fetched very high prices. Practically, therefore, these private efforts led to no further development of the fishing industry.

In spite, however, of these disappointing results, there was a general belief that the South African seas, if thoroughly and systematically explored, would reveal large areas in which fish could be caught in quantities, sufficient at least to supply the needs in South Africa, and a few individuals who were acquainted with the more modern methods of scientific research in fishing work, began to urge on Government the necessity of a survey of the Cape seas. It was pointed out that no private individual or company could afford to make a thorough examination of the resources of the Cape seas, that such costly attempts had to be abandoned if they did not lead to almost immediate practical results, and even then there was no guarantee that others might not step in and reap the benefit of discoveries made. They urged that such a survey was the duty of the State, and ultimately the reasons advanced for taking such a step prevailed, and Government in 1895 was induced to take the initial steps in instituting a survey on the lines of modern scientific research followed elsewhere in fishing matters.

The detailed results of this work need not be gone into. At first numerous difficulties were met, the methods best adapted for use in South Africa had to be discovered by experiment, and the direction in which suitable fishing areas were to be looked for were entirely unknown. The final results need only be mentioned, and these were such as to fully justify the expenditure incurred. Several areas were found, hitherto unknown, in which fish were found in an abundance that justified the most sanguine anticipations, and, in addition, the valuable Sole was procured in catches rivalling those of the North Sea. The significance of this may be most clearly shown by the fact that the Government research steamer in a three months' test in the year 1899 procured on these new fishing grounds about 4,000 cwt. of fish, while in the same year the average catch of fish of all

the fishing boats on the coast for a similar period was 24,887 cwts. Moreover, included in the catch of the trawler were over 56,000 Soles, a fish practically absent from the catches of the ordinary fishing boats. Subsequent to this discovery, the survey was continued to find out the extent of the fishing ground, an essential matter in the question of the possible development of the industry. It was found that the area was large enough to justify the publication of details in order to induce private companies to follow up the work. No difficulty was experienced in this, and steam trawlers from South Africa and from Grimsby were soon at work on the new fishing grounds; the result being that the fish supply to South Africa was more than doubled. The average annual catch of Cape fishes was about 100,000 cwts., and in the year 1913 that of the three trawlers, working from Cape Town alone, in the new fishing areas was 125,000 cwts. There are eight trawlers now at work.

The results attained were so far satisfactory and sufficient to meet the immeditae demands of the country. There were, however, still large areas unexamined, and as it was the intention to complete the survey, the necessary steps were taken to continue the work. A period of financial depression, however, set in about this time, and it was considered necessary to suspend the work, more especially as it was thought that the results attained were sufficient, for a time at least.

It is now about twelve years since the survey was suspended, and the industry has developed to a large extent on the lines laid down. The increased and regular supply has, however, as is usually the case, led to an increased demand, while the older inshore fishing grounds have become less productive. In fact, there have been several occasions of recent years in which practically the only supply of fish for Cape Town has been from the trawlers, and, as a rule, the demand for the ordinary food fish is now greater than the supply.

As already indicated, there are extensive areas which have not been explored, and, from information received from various quarters, there appears to be large supplies of fish on these grounds. Thus the whalers, who have sometimes to proceed some considerable distance to sea to such areas, have reported that they have seen fish there in enormous numbers. It has even been stated that Cod are to be found far to sea, and, though this is very doubtful, it is a fact that the resources of the seas beyond the areas explored are entirely unknown.

It is unfortunate that not only the exploratory work was suspended for financial reasons, but also the collection of fishery statistics, which had up to that time been procured with sufficient accuracy to indicate the lines along which progress was being made. But there is good reason for

believing that though the supply has been so largely increased, there is still room for large expansion in the South African market. There are times of plenty during the year when the supply is sufficient to meet the present demand, but there are also many occasions when the fish supply is inadequate. There is also the possibility of a large export trade, such as brings large sums of money to such places as Canada, Newfoundland, etc. This therefore is an additional reason for taking steps as soon as possible to ascertain the extent of the fishing grounds of South Africa.

The second aspect of the question which I have mentioned is the necessity for a fuller knowledge of the habits of fish, their movements from place to place, their spawning habits, the conditions which determine their appearance and disappearance, etc. These are fundamental questions in the development and conservation of the industry. To mention one instance, it is stated that some fish in South Africa depend on the estuaries and rivers for spawning purposes, and that the cause of the "disappearance" of certain fish is certain methods of fishing in these places. Again, it is alleged that set nets in the sea at certain places so disturb the regular movements of such fish as the Geelbek that the fishing by line for these has fallen off very considerably. Again, certain fish like the Snoek are extremely erratic in their movements, and it is with difficulty that the time and place of their probable occurrence is known.

It is probable that further research into the peculiar currents, changing temperatures and salinities of the South African seas would throw a great deal of light on many of the practical questions of the fishing industry, and this should also be a feature of any general fishing survey.

As to the actual steps that may be taken to carry on the survey, there are peculiar difficulties at the present time in the way of carrying out the work, particularly in the matter of procuring a suitable vessel, but, under normal conditions, this difficulty would not be experienced. The trawler, the "Pieter Faure," is still in the possession of the Government, and could be again employed in the exploratory work for which it was designed, or a vessel could be hired for a time from one of the trawling companies.

The initiation of the work, however, need not be delayed, as there is a great part of it which can be carried on by the occasional hire of a boat working in conjunction with the present Marine Laboratory at St. James.

The work at the Marine Laboratory also was much crippled at the time of the financial depression, and though it has been kept working, and much valuable information has now been obtained, particularly concerning the spawning and general habits of fish, information which has been of great practical

value, the work has been much hampered not only for want of funds for the ordinary routine work, but also for lack of accommodation and equipment. The building was only partly completed at the time of the depression, and the equipment in scientific appliances, the necessary books of reference on marine biological matters, etc., was very inadequately provided for, so that the work has been carried on under the greatest difficulties. Additional assistance is much required. Of recent years this has consisted only of a caretaker employed at five shillings a day, and the valuable services of a voluntary worker, Mr. Wardlaw Thompson, who has carried out valuable work, and whose recent death has been a serious loss to the institution. The work carried on at such a laboratory is recognised everywhere as a necessary adjunct to marine biological fishery work.

I may add that, despite unfavourable financial and other conditions, a certain amount of investigation at sea is being carried on in the Cape Province.

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